This set is purpose built for the professional incorporating all the tools needed for injector removal or a range of slide hammers that can be adapted for pulling out pins, bushes, seals. A very heavy duty kit with everything stored in a sturdy blow molded case.
This professional tool is a specialized sliding hammer for removal of stuck and seized common rail injectors without dismantling the cylinder head for all injection nozzle cars, trucks and earthmoving machines. The robust construction enables rapid withdrawal of even the most severely seized injector.

Item Description
Includes the following components:
-3 different slide hammers
1.6 kg, 160 mm length
2.7 kg, 460 mm length
5.1 kg, 600 mm length
-2 pulling claws with fork opening
13.7 x 18 mm, 105 mm length
12.7 x 19 mm, 130 mm length
-5 slotted 6-pt 1/2" sockets, 100 mm length
Sizes 25 - 27 - 28 - 29 - 30 mm
-Injector extractor, sleeve design, with shells
Outer diameter 35 mm
Internal diameter 29 mm
M17 x 1.0 spindle
Pulling adapter with external thread M27 x 1.0 (3pcs) and M25 x 1.0
Pulling adapter with internal thread M27 x 1.0 (3pcs)
Sliding hammer adapter for Inner, outer and claw extractor

- Removal of stuck and seized common rail injectors without dismantling the cylinder head for all injection nozzle cars
- Various adapters make the kit suitable for most diesel injectors
- The robust construction enables rapid withdrawal, even the most severely seized injector will come out with little fuss
- The kit comes with adaptors, 3.9kg weight, handle and injector extractors. Ideal for the professional mechanic or enthusiastic DIY'er. Made by professional for professionals.
- All comes in a storage case

Neilsen 40Piece Injector Extractor with Common Rail Adaptor - NEW 22kg box set

This professional tool is a specialised sliding hammer for removal of stuck and seized common rail injectors without dismantling the cylinder head for all injection nozzle cars.

The robust construction enables rapid withdrawal, even the most severely seized injector will come out with little fuss.

The kit comes with adapters, 3.9kg weight, handle and injector extractors.

Ideal for the professional mechanic or enthusiastic DIY'er Made by professionals for professionals.

Specification
- M14 x 1.5 for Delphi dalphi adaptor
- M17 x 1 for Bosch adaptor
- M20 x 1 for Denso adaptor
- M25 x 1 for Siemens adaptor
- M27 x 1 for Siemens adaptor
- M27 x 1 for Bosch injector nozzle adaptor
- Puller with M14 x 1.5P
- Piece injection nozzle socket 100L - 25, 27, 29 and 30mm (6Pt)

Diesel Injector Extractor Master Set 3 X Slide hammer, 1.6KG, 160mm. 2.7KG, 460mm. 5.1KG, 600mm. Pulling claws with fork opening 13.7× 18mm, 105mm long, 12.7× 19mm, 130mm long. Slotted 1/2" Drive sockets, 6 pt, 100mm long. 25/27/28/29/30mm. Sleeve design injector extractor with supporting shells, outer diameter 35mm, internal diameter 29mm, M17× 1.0 spindle. Pulling adapter with external thread M27× 1.0(3pcs) and M25× 1.0. Pulling adapter with internal thread M27× 1.0(3pcs). Sliding hammer adapter for inner, outer and claw extractor.

NEILSEN®

DIESEL INJECTOR PULLER *For Citroen and Peugeot*

CT3583

IMPORTANT: **PLEASE READ THESE INSTRUCTIONS CAREFULLY. NOTE THE SAFE OPERATIONAL REQUIREMENTS, WARNINGS AND CAUTIONS. USE THE PRODUCT CORRECTLY AND WITH CARE FOR THE PURPOSE FOR WHICH IT IS INTENDED. FAILURE TO DO SO MAY CAUSE DAMAGE AND/OR PERSONAL INJURY AND WILL INVALIDATE THE WARRANTY. PLEASE KEEP INSTRUCTIONS SAFE FOR FUTURE USE.**

1. SAFETY INSTRUCTIONS

- ❐ **WARNING!** *Ensure Health and Safety, local authority and general workshop practice regulations are adhered to when using tools.*
- ❐ **WARNING! Always use caution when working around fuel systems. The fuel in the fuel rail may be pressurised even if the engine is not running.**
- ❐ ***IMPORTANT:*** *These instructions are provided as a guide only. Always refer to the vehicle manufacturer's service instructions, or a proprietary manual, to establish the current procedure and data, also any warnings or cautions particular to the vehicle.*
- ✗ **DO NOT** use the set if any parts are missing or damaged.
- ✗ **DO NOT** use this tool for any purpose other than that for which it is designed.
- ✓ Switch off vehicle's ignition and disconnect the battery before commencing work under the bonnet.
- ✓ You must follow the vehicle's service manual cautions when working around the air bag system. If the cautions are not followed the air bag may deploy unexpectedly even after the ignition is turned 'OFF', resulting in personal injury.
- ✗ Never lay tools on the vehicle's battery. This may short the terminals together, causing harm to yourself, the tools, or the battery.
- ✓ Operate in a well ventilated area. Do not inhale fuel vapours.
- ✓ Wear approved eye protection. A full range of personal safety equipment is available from your dealer.
- ✓ Wear suitable clothing to avoid snagging. Do not wear jewellery and tie back long hair.
- ✓ Keep children and other unauthorised persons away from the working area.
- ✓ Keep yourself, tools, and test equipment away from hot engine parts.
- ✓ Always keep a fire extinguisher close by, that is suitable for fuel/ electrical/chemical fires.
- ✗ **NEVER** smoke or have open flames near vehicle.
- ✓ Always relieve fuel pressure before disconnecting fuel lines from injectors.
- ✓ Use a rag to cover fuel line fittings, when connecting or disconnecting fuel lines. Avoid contact with fuel.
- ✓ Clean up all fuel spills immediately and dispose of all rags properly.
- ✓ Maintain the tool components in good and clean condition for best and safest performance.
- ✓ When work on the vehicle is finished, ensure all connections on vehicle are restored, and that there are no tools left in the engine bay.
- ✓ Replace tools in the carrying case and store in a safe, dry, childproof location.

2. INTRODUCTION & CONTENTS

Comprehensive set for removing Citroen/Peugeot 2.0/2.2HDi 16v fuel injectors. Allows the removal of seized injectors without the need to remove the cylinder head. Bridge fits perfectly on the cylinder head preventing damage to the area surrounding the injector. Supplied in carry-case.

Contents: (refer to fig.1)

Item	**Description**
1	Bridge
2	3 x Bridge Legs
3	2 x Force Screws - Thread 17mm, 25mm x Pitch 1mm
4	Force Screw Nut
5	Injector Sockets 25mm, 29mm
6	Security Hex Key - 10mm

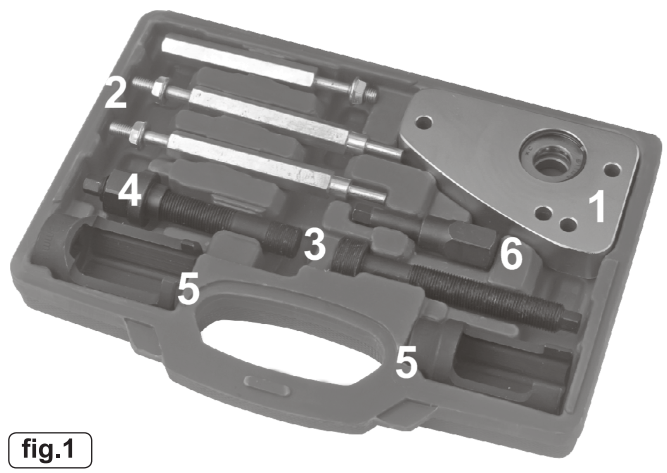


fig.1

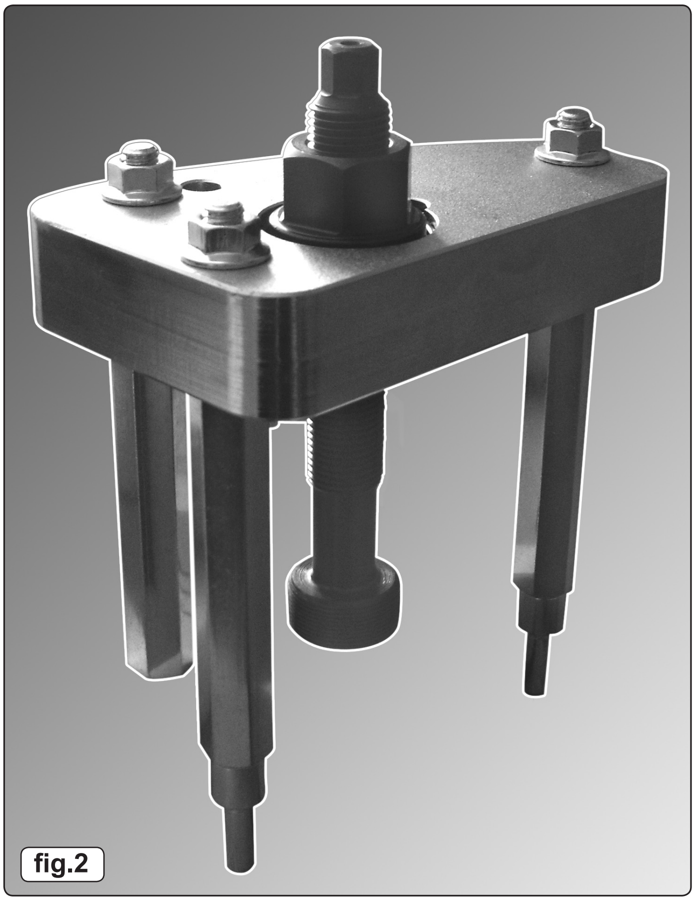


fig.2

CANNON TOOLS LTD
Add: 20 station road, Rowley Regis, west midlands,B65 0JU.U.K.

3. ASSEMBLY

3.1. Referring to the individual components in fig.1. assemble the Injector Puller minus the force screw as shown in fig.2. overleaf. a different configuration of the bridge legs may be needed depending on engine.

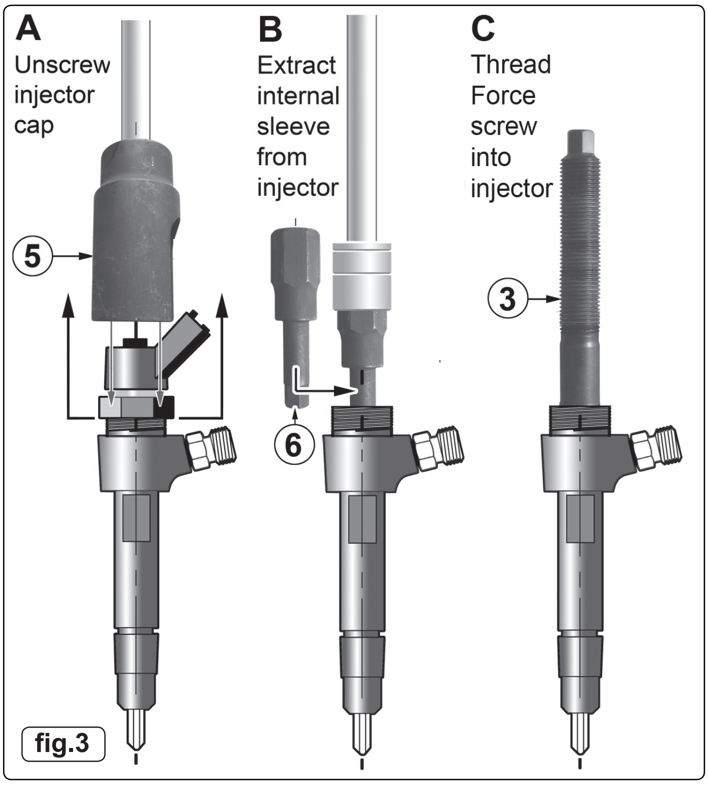

A
Unscrew injector cap
5
B
Extract internal sleeve from injector
6
C
Thread Force screw into injector
3

fig.3

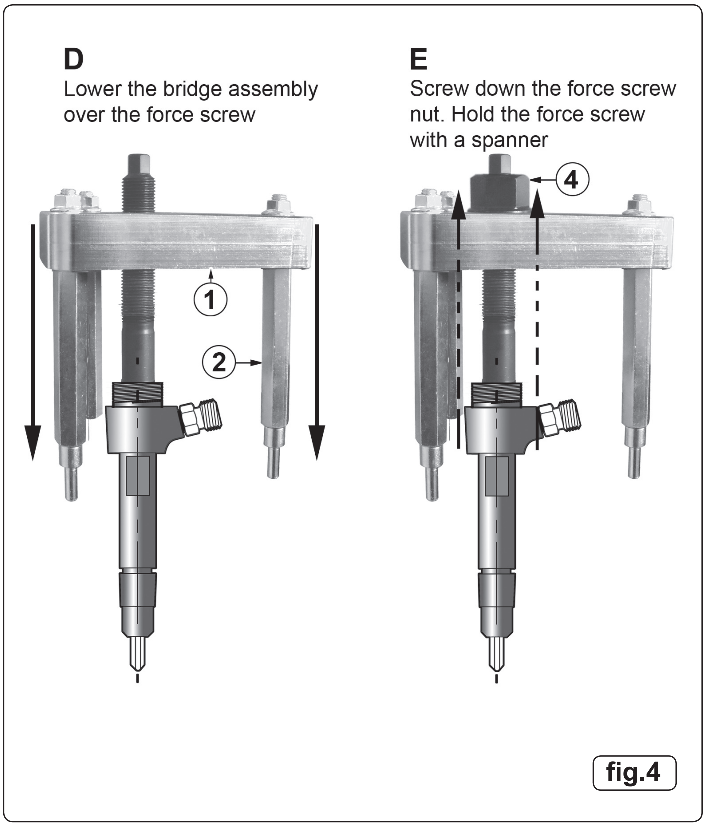

D
Lower the bridge assembly over the force screw
1
2
E
Screw down the force screw nut. Hold the force screw with a spanner
4

fig.4

4. OPERATION

4.1. Before working on the fuel system, make sure that the fuel system is **NOT** pressurised. Refer to the manufacturer's instruction manual on how to de-pressurise the system.

4.1.1. Disconnect the injector wires and connections as per the manufacturer's instructions.

4.1.2. Remove any carbon build up from around the injector.

4.1.3. Remove the cap from the injector using the appropriate size socket (fig.3A).

4.2. Removing Inner Sleeve. (fig.3).

4.2.1. Remove the internal parts from the injector to gain access to use the security hex key (fig.3.6). It may be necessary to remove the injector veins by force. Insert the security hex into the inner sleeve. Turn the security hex anti-clockwise using a 21mm socket to remove the inner sleeve (fig.3B).

4.2.2. Select the appropriate force screw and screw into the threads of the injector and tighten with a suitable spanner (fig.3C).

4.3. Removing the injector. (fig.4).
It will be necessary to remove the engine cam cover and possibly a manifold bolt, please refer to the manufacturer's manual for instruction. The removal of certain bolts from the engine will allow suitable space and support for the bridge legs to use.

4.3.1. Slide the bridge assembly over the force screw, inserting the legs into the appropriate holes for a sturdy footing (fig.4D).

Note: One leg is flat and is to be used on the top of the cylinder head and not to be inserted into a bolt hole.

4.3.2. Screw the force screw nut onto the force screw until finger tight.

4.3.3. Using appropriately sized spanners, hold the force screw securely with one spanner, and tighten the nut with the other, the injector should gradually slide out.

Note: An approximate force of NO MORE THAN 150Nm should be applied to the nut, and a socket should NOT be used.
Whilst applying force, constantly check the seating of the tool and ensure that there is no twisting of the bridge assembly.

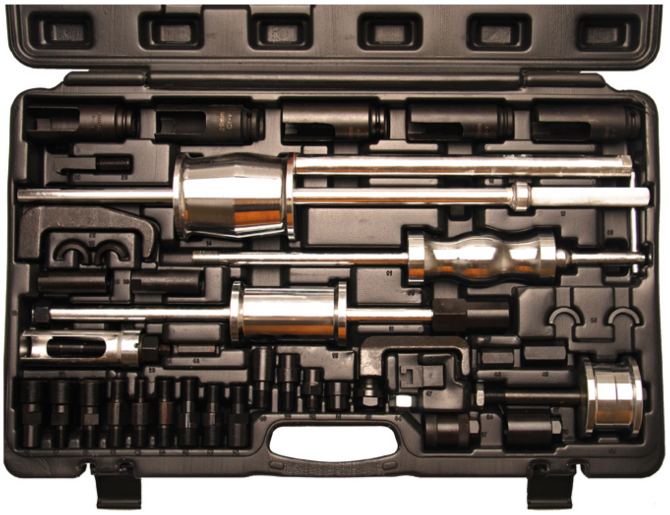
4.3.4. If the injector cannot be removed, it may be necessary to use a suitable penetrating oil and leave for a period of time, before applying force again. If the injector still cannot be removed, consult a main dealer or a diesel specialist, to avoid damage to the engine.

4.3.5. When an injector has been removed, it is recommended that only a new or refurbished injector is fitted. Follow the manufacturer's fitting and safety instructions.

ALWAYS KEEP FORCE SCREW WELL LUBRICATED.

**DO NOT USE AIR TOOLS,
IMPACT WRENCHES,
BREAKER BARS
OR SOCKETS**

DIESEL INJECTOR EXTRACTOR MASTER KIT CT3507



GENERAL

These tools are designed for removing different injectors. Set includes internal hex. bit and deep open profile sockets used to dismantle injectors plug adaptors for attaching the sliding hammer.

Please read these instructions carefully. Note the safe operational requirements, warnings and cautions. Use the product correctly and with care for the purpose for which it is intended. Failure to do so may cause damage and/or personal injury and will invalidate the warranty. Please keep instructions safe for future use.

SAFETY INSTRUCTIONS

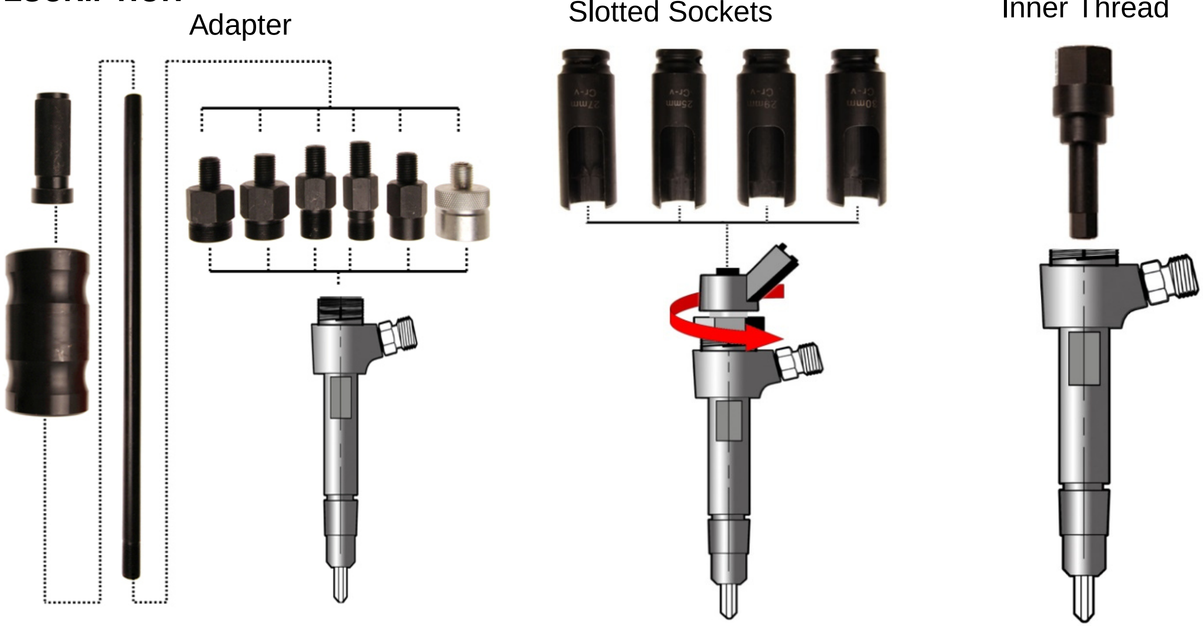
- Ensure Health and Safety, local authority and general workshop practice regulations are adhered to when using tools.
- Always use caution when working around fuel systems. The fuel in the fuel rail may be pressurised even if the engine is not running.
- These instructions are provided as a guide only.
- Always refer to the vehicle manufacturer's service instructions, or a proprietary manual, to establish the current procedure and data, also any warnings or cautions particular to the vehicle.
- DO NOT use the set if any parts are missing or damaged.
- DO NOT use this tool for any purpose other than that for which it is designed.
- Switch off vehicle's ignition and disconnect the battery before commencing work under the bonnet.
- Never lay tools on the vehicle's battery. This may short the terminals together, causing harm to yourself, the tools, or the battery.
- Operate in a well ventilated area. Do not inhale fuel vapours.
- Wear approved eye protection.
- Wear suitable clothing to avoid snagging. Do not wear jewellery and tie back long hair.
- Keep children and other unauthorised persons away from the working area.
- Keep yourself, tools, and test equipment away from hot engine parts.
- Always keep a fire extinguisher close by, that is suitable for fuel electrical or chemical fires.
- NEVER smoke or have open flames near vehicle.
- Always relieve fuel pressure before disconnecting fuel lines from injectors.
- Use a rag to coyer fuel line fittings, when connecting or disconnecting fuel lines. Avoid contact with fuel.
- Clean up ail fuel spills immediately and dispose of ail rags properly.
- Maintain the tool components in good and clean condition for best and safest performance.
- When work on the vehicle is finished, ensure all connections on vehicle are restored, and that there are no tools left in the engine bay.
- Replace tools in the carrying case and store in a safe, dry, childproof location.

TOOLS

This tool set includes also the following components:

3 different slide hammer 1,6 Kg x 160 mm - 2,7 Kg x 460 mm - 5,1 Kg x 600 mm
Pulling claws with fork opening, 13.7 x 18 mm, 105 mm long - 12.7 x 19 mm, 130 mm long
Slotted 6-pt 1/2" sockets, 100 mm long, sizes 25 - 27 - 28 - 29 - 30 mm
Injector extractor in sleeve design with supporting shells, OD 35 mm, ID 29 mm
Spindle M17 x 1.0
Pulling adapter with external thread, M27 x 1.0 (3pcs) and M25 x 1.0
Pulling adapter with internal thread, M27 x 1.0 (3pcs)
Sliding hammer adapter for inner, outer and claw extractor

DESCRIPTION



NOTE: The technique required for removal of the injector will depend on which system is fitted to the vehicle. Always use an external adaptor first if possible. If by using reasonable force the injector cannot be removed, use an internal adaptor. Before working on the fuel system, make sure that the fuel system is NOT pressurised. Refer to the manufacturer's instruction manual on how to de-pressurise the system. Disconnect the injector wires and connections as per the manufacturer's instructions. Remove any carbon build up from around the injector. Remove the electrical unit from the injector.

OPERATION

Use of external adaptor

Remove the electrical unit. (see **A**)

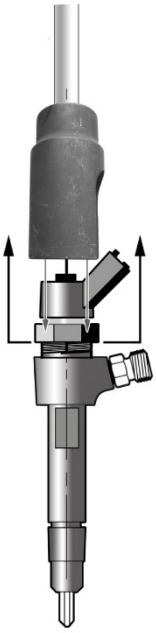
Position the adapter with outside thread on top of the injector (see **B)**

Connect sliding hammer to the adapter with outside thread. (see **C**)

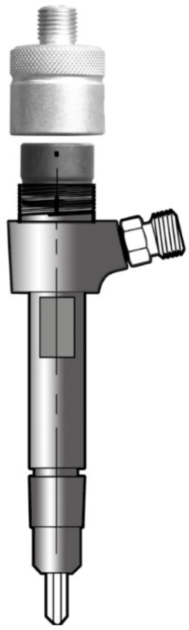
The injector can be removed by using reasonable force on the sliding hammer.

When an injector has been removed, it is recommended that only a new or refurbished injector is fitted.

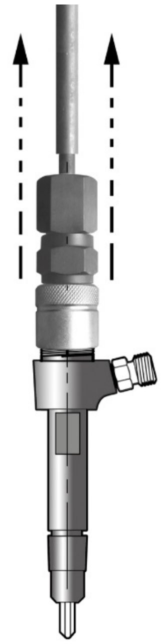
Follow manufacturers fitting and safety instructions.



A



B



C

Use of internal adaptor

Remove the electrical unit

Insert and turn anti-clockwise a special hex socket to remove the inner sleeve (see **D**).

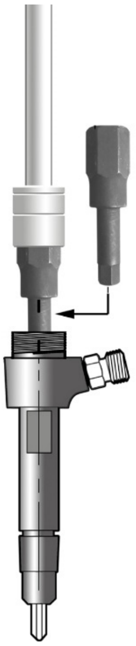
Screw the appropriate internal adaptor (5) into the threads of the injector and tighten with a suitable spanner (see **E**).

Screw the slide hammer onto the adaptor.

The injector can now be removed using reasonable force on the slide hammer (see **F**). Be prepared for the sudden release of the injector from the cylinder head.

When an injector has been removed, it is recommended that only a new or refurbished injector is fitted.

Follow manufacturers fitting and safety instructions.



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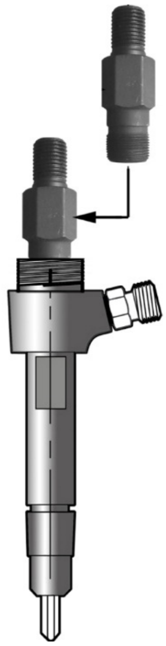

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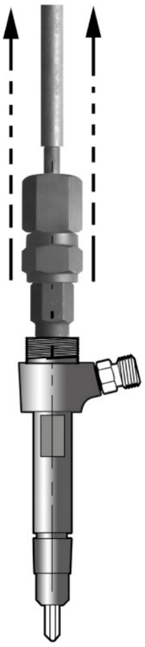
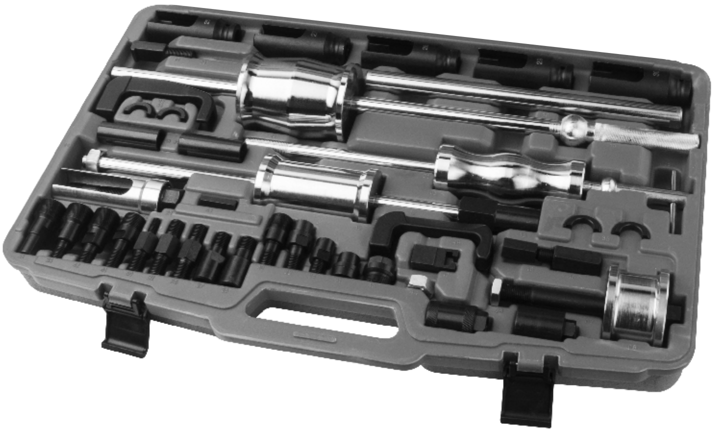


F

NOTE:
To protect the threads all adaptors must be fixed tightened.

NEILSEN®

DIESEL INJECTOR EXTRACTOR MASTER KIT CT3507



GENERAL

These tools are designed for removing different injectors. Set includes internal hex. bit and deep open profile sockets used to dismantle injectors plug adaptors for attaching the sliding hammer.

Please read these instructions carefully. Note the safe operational requirements, warnings and cautions. Use the product correctly and with care for the purpose for which it is intended. Failure to do so may cause damage and/or personal injury and will invalidate the warranty. Please keep instructions safe for future use.

SAFETY INSTRUCTIONS

- Ensure Health and Safety, local authority and general workshop practice regulations are adhered to when using tools.
- Always use caution when working around fuel systems. The fuel in the fuel rail may be pressurised even if the engine is not running.
- These instructions are provided as a guide only.
- Always refer to the vehicle manufacturer's service instructions, or a proprietary manual, to establish the current procedure and data, also any warnings or cautions particular to the vehicle.
- DO NOT use the set if any parts are missing or damaged.
- DO NOT use this tool for any purpose other than that for which it is designed.
- Switch off vehicle's ignition and disconnect the battery before commencing work under the bonnet.
- Never lay tools on the vehicle's battery. This may short the terminals together, causing harm to yourself, the tools, or the battery.
- Operate in a well ventilated area. Do not inhale fuel vapours.
- Wear approved eye protection.
- Wear suitable clothing to avoid snagging. Do not wear jewellery and tie back long hair.
- Keep children and other unauthorised persons away from the working area.
- Keep yourself, tools, and test equipment away from hot engine parts.
- Always keep a fire extinguisher close by, that is suitable for fuel electrical or chemical fires.
- NEVER smoke or have open flames near vehicle.
- Always relieve fuel pressure before disconnecting fuel lines from injectors.
- Use a rag to coyer fuel line fittings, when connecting or disconnecting fuel lines. Avoid contact with fuel.
- Clean up ail fuel spills immediately and dispose of ail rags properly.
- Maintain the tool components in good and clean condition for best and safest performance.
- When work on the vehicle is finished, ensure all connections on vehicle are restored, and that there are no tools left in the engine bay.
- Replace tools in the carrying case and store in a safe, dry, childproof location.

TOOLS

This tool set includes also the following components:

3 different slide hammer 1,6 Kg x 160 mm - 2,7 Kg x 460 mm - 5,1 Kg x 600 mm

Pulling claws with fork opening, 13.7 x 18 mm, 105 mm long - 12.7 x 19 mm, 130 mm long

Slotted 6-pt 1/2" sockets, 100 mm long, sizes 25 - 27 - 28 - 29 - 30 mm

Injector extractor in sleeve design with supporting shells, OD 35 mm, ID 29 mm

Spindle M17 x 1.0

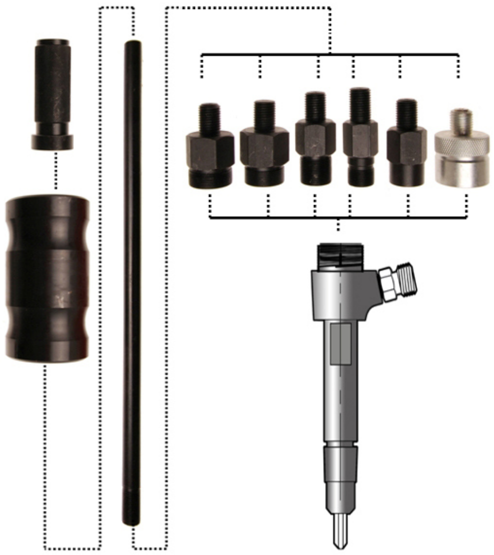
Pulling adapter with external thread, M27 x 1.0 (3pcs) and M25 x 1.0

Pulling adapter with internal thread, M27 x 1.0 (3pcs)

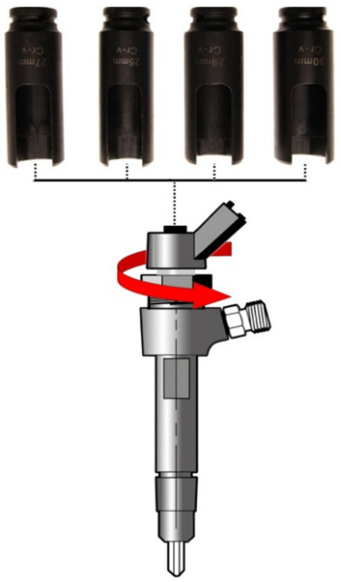
Sliding hammer adapter for inner, outer and claw extractor

DESCRIPTION

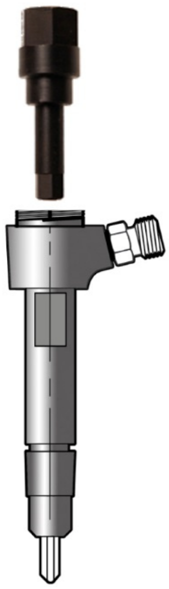
Adapter



Slotted Sockets



Inner Thread



NOTE: The technique required for removal of the injector will depend on which system is fitted to the vehicle. Always use an external adaptor first if possible. If by using reasonable force the injector cannot be removed, use an internal adaptor. Before working on the fuel system, make sure that the fuel system is NOT pressurised. Refer to the manufacturer's instruction manual on how to de-pressurise the system. Disconnect the injector wires and connections as per the manufacturer's instructions. Remove any carbon build up from around the injector. Remove the electrical unit from the injector.

OPERATION

Use of external adaptor

Remove the electrical unit. (see **A**)

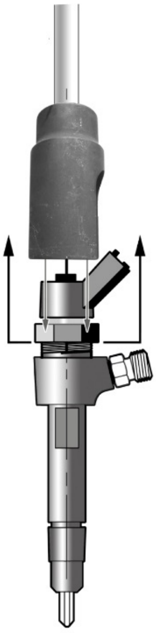
Position the adapter with outside thread on top of the injector (see **B)**

Connect sliding hammer to the adapter with outside thread. (see **C**)

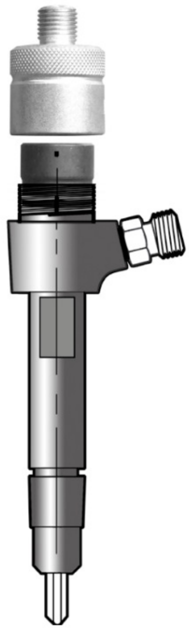
The injector can be removed by using reasonable force on the sliding hammer.

When an injector has been removed, it is recommended that only a new or refurbished injector is fitted.

Follow manufacturers fitting and safety instructions.



A



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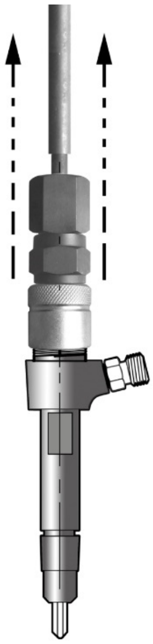


C

Use of internal adaptor

Remove the electrical unit

Insert and turn anti-clockwise a special hex socket to remove the inner sleeve (see **D**).

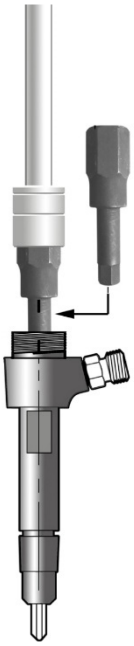
Screw the appropriate internal adaptor (5) into the threads of the injector and tighten with a suitable spanner (see **E**).

Screw the slide hammer onto the adaptor.

The injector can now be removed using reasonable force on the slide hammer (see **F**). Be prepared for the sudden release of the injector from the cylinder head.

When an injector has been removed, it is recommended that only a new or refurbished injector is fitted.

Follow manufacturers fitting and safety instructions.



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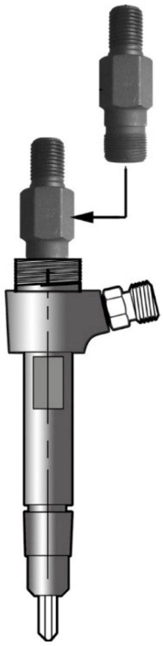

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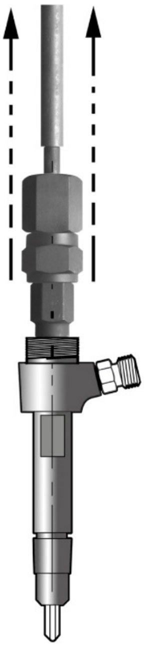


F

NOTE:
To protect the threads all adaptors must be fixed tightened.

18 PIECE INJECTOR REMOVER PULLER SET

CT3506

IMPORTANT: **PLEASE READ THESE INSTRUCTIONS CAREFULLY. NOTE THE SAFE OPERATIONAL REQUIREMENTS, WARNINGS AND CAUTIONS. USE THE PRODUCT CORRECTLY AND WITH CARE FOR THE PURPOSE FOR WHICH IT IS INTENDED. FAILURE TO DO SO MAY CAUSE DAMAGE AND/OR PERSONAL INJURY AND WILL INVALIDATE THE WARRANTY. PLEASE KEEP INSTRUCTIONS SAFE FOR FUTURE USE.**

1. INTRODUCTION

1.1 Introduction

Injector remover/installer and service kit for petrol injectors found in VAG vehicles covering 1.4, 1.6, 1.8, 2.0, 2.7 V6, 3.0 V6, 3.2 V6, 3.6 V6 and 4.2 V8 FSi engines.

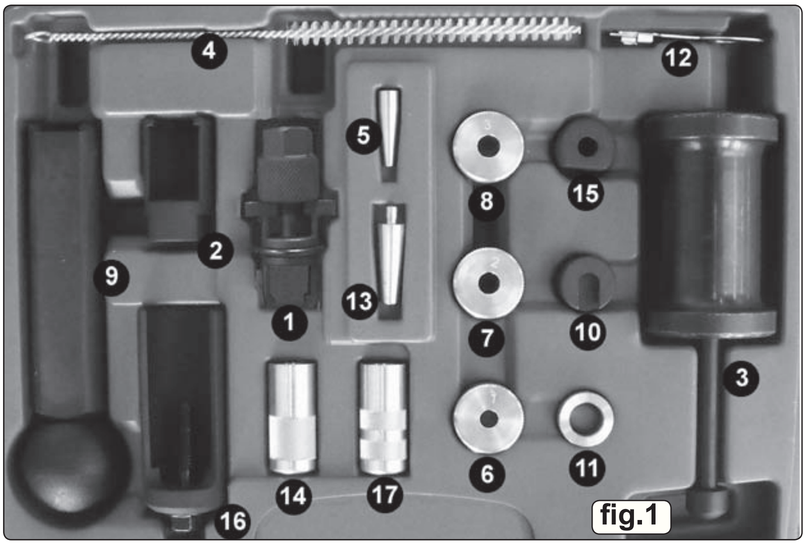


fig.1

2. CONTENTS

2.1 Contents (fig.1)

Item	Description	OEM Number
1	Injector Remover 2 Leg - use with .3	T10133/1
2	Injector Remover - use with .3 or .16	T10133/2
3	Slide Hammer	T10133/3
4	Cleaning Brush	T10133/4
5	Teflon Ring Assembly Cone	T10133/5
6	Teflon Ring Assembly Sleeve (No.1)	T10133/6
7	Teflon Ring Calibration Sleeve (No.2)	T10133/7
8	Teflon Ring Calibration Sleeve (No.3)	T10133/8
9	Injector Installer	T10133/9
10	Injector Remover	T10133/10
11	Teflon Ring Spacer Sleeve	T10133/11
12	Support Ring Locking Plate	T10133/12
13	Support Ring Assembly Cone	T10133/13
14	Support Ring Calibration Sleeve (Single Knurl)	T10133/14
15	Injector Remover - use with 3	T10133/15
16	Injector Remover Bridge	T10133/16
17	Support Ring Calibration Sleeve (Double Knurl)	T10133/17

3. SAFETY INSTRUCTIONS

❒ **WARNING!** *Ensure Health and Safety, local authority and general workshop practice regulations are adhered to when using tools.*
❒ **WARNING!** Petrol fumes and battery gases are explosive, **DO NOT** smoke or allow a naked flame or sparks in the work area.
✓ Keep a dry chemical (class B) fire extinguisher near to the work area.
✓ Avoid fire hazard by using caution when disconnecting fuel lines, as some spillage is inevitable.
✗ **DO NOT** let fuel spill onto a hot engine.
✓ Before repairing the fuel system, turn off the ignition switch and disconnect the battery as per manufacturer's procedure. Never disconnect the battery while the engine is running.
❒ **WARNING!** Wipe up fuel spills immediately.
✗ **DO NOT** use tools if damaged.
✓ Maintain tools in good and clean condition for best and safest performance.
✓ Ensure that a vehicle which has been jacked up is adequately supported with axle stands.
✓ Wear approved eye protection. A full range of personal safety equipment is available from your dealer.
✓ Wear suitable clothing to avoid snagging. **DO NOT** wear jewellery and tie back long hair.
✓ Keep children and unauthorised persons away from the work area.
✗ **DO NOT** attempt to start engine with the injectors removed.
✓ **Always** display a warning notification on steering wheel when engine components have been removed.
✓ Account for all tools and parts being used and **DO NOT** leave them in or near the engine.
✓ Ensure all pieces are returned to the case and store this in a safe, dry, childproof location.

IMPORTANT: *These instructions are provided as a guide only. Always refer to the vehicle manufacturer's service instructions, or a proprietary manual, to establish the current procedure and data.*

WARNING: The warnings, cautions and instructions in this manual cannot cover all possible conditions and situations that may occur. It must be understood that common sense and caution are factors which cannot be built into this product, but must be applied by the operator.

4. DESCRIPTION

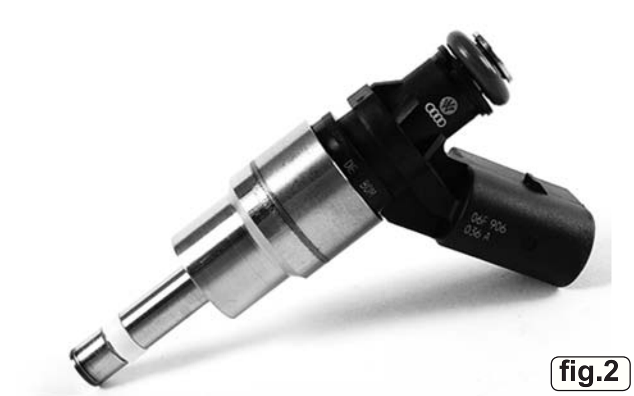


fig.2

4.1 Technical Description

4.1.1 FSi Injector Remover/Installer and Service Kit contains the specialised tools required for the removal and installation of the high pressure injectors from the current FSi/TFSi engines fitted in AUDI, SEAT, SKODA and VOLKWAGEN models.

4.1.2 In addition the kit includes the special fitting and calibration tools required when fitting new seals and support rings on the injectors.

4.1.3 The tools within the kit are used in various combinations dependant on the engine and injector design. This instruction can only provide a guide on the use of the various tools and reference should always be made to the appropriate workshop instructions for the engine being worked on and a visual examination of the injector to establish the correct selection of tools from the kit, particularly with regard to replacement and fitting of new seals.

4.1.4 The technical instructions are divided into 4 sections:
Section 5 - Injector parts identification/assembly
Section 6 - Injector Removal
Section 7 - Seal Replacement
Section 8 - Injector Installation

5. PARTS IDENTIFICATION/ INJECTOR ASSEMBLY

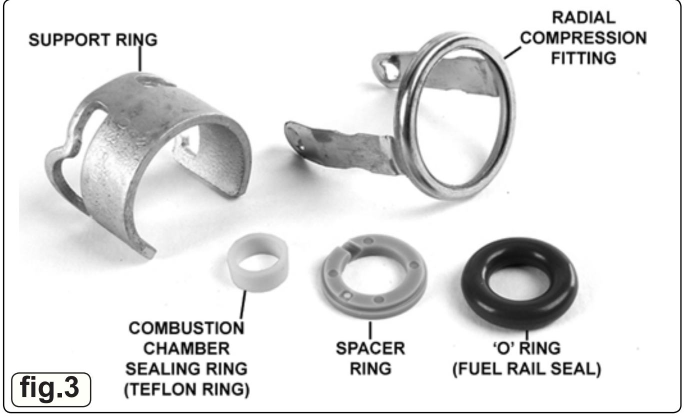

SUPPORT RING
RADIAL COMPRESSION FITTING
COMBUSTION CHAMBER SEALING RING (TEFLON RING)
SPACER RING
'O' RING (FUEL RAIL SEAL)

fig.3

(fig.3) Typical Injector Replacement Parts Set Example 2.0 FSi engine injector.

When this injector is fitted in the cylinder head, the assembly is as follows (fig.4):

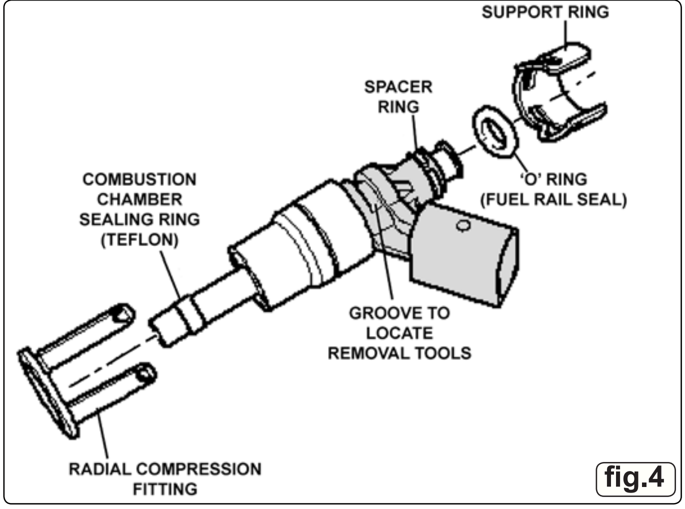

SUPPORT RING
SPACER RING
COMBUSTION CHAMBER SEALING RING (TEFLON)
'O' RING (FUEL RAIL SEAL)
GROOVE TO LOCATE REMOVAL TOOLS
RADIAL COMPRESSION FITTING

fig.4

6. INJECTOR REMOVAL

6.1 Injector Access

6.1.1 FSi injectors are located in the cylinder head and fuel is supplied via a fuel rail which can be an intake manifold/ fuel rail assembly. Injectors can only be accessed after removal of the manifold/fuel rail assembly and therefore some disassembly and hose disconnections are required.

☒ **WARNING! - FUEL SPILLAGE: Be prepared for residual fuel in the fuel rail to drain out as the fuel rail is removed. ENSURE NO SOURCE OF FLAME OR SPARK IS CLOSE BY AND CLEAN UP SPILLAGE IMMEDIATELY.**

6.1.2 Having gained access to the injectors unplug the electrical connections from the injectors.

6.2 Removal Tools - Injector

6.2.1 If the complete injector assembly cannot be removed from the cylinder head easily by hand and there is a need to use Removal Tools, the injector support ring must be removed in order to fit the appropriate Removal Adaptor into the groove in the injector.

6.2.2 The injector removal tools available with the kit are listed as follows:

a) 1 Remover 2 Leg - use in conjunction with 3 (fig.5)
b) 2 Remover Adaptor - use in conjunction with 3 (fig.6) or 16 (fig.7)
c) 3 Slide Hammer
d) 10 Remover Adaptor - use in conjunction with 3
e) 15 Remover Adaptor - use in conjunction with 3
f) 16 Remover Bridge

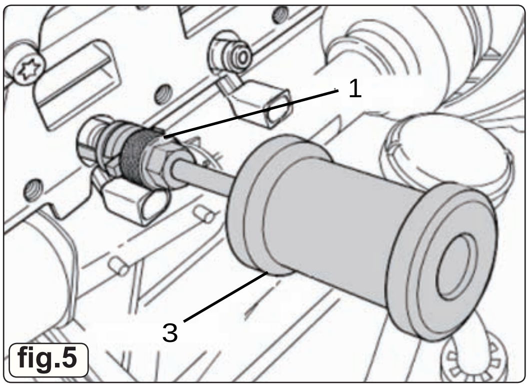


fig.5

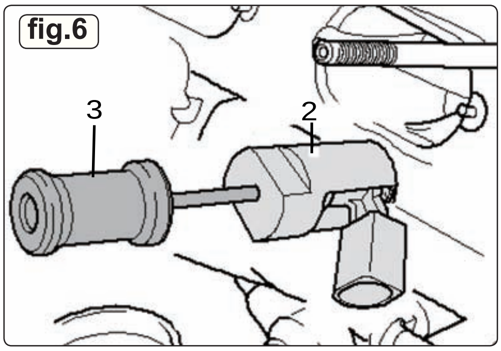


fig.6

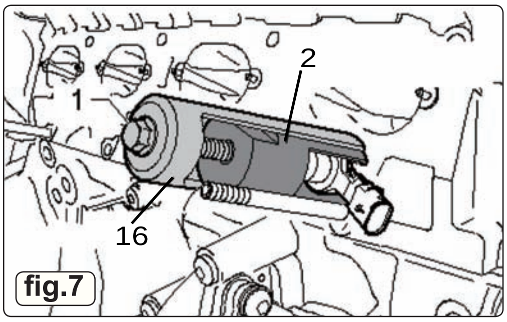


fig.7

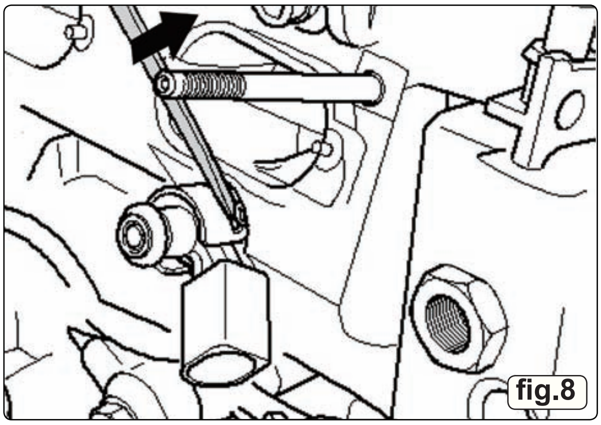


fig.8

6.3 Removing Injector

6.3.1 When the injector is fitted in the cylinder head the radial compensation fitting is 'clipped' onto the support ring and must be detached. A suitable screwdriver can be used to lever the tags of the radial compensation fitting out of the support ring in order that it can be pulled off the injector (fig.8). It is not unusual for these tags to break during release, or for the radial compensation fitting to be destroyed during removal of a stubborn injector, and therefore this fitting will require replacement.

6.3.2 Remove the support ring off the injector, select the appropriate combination of removal tools from this kit and ft them on to the injector in the groove position provided.

Note: When using the slide hammer, use 'restrained' impact action. Heavy blows should not be necessary.

7. SEAL REPLACEMENT

Note: The combustion chamber sealing ring (Teflon ring) **MUST ALWAYS** be replaced - **DO NOT** grease or apply any lubricant to the new seal during installation on the injector or when fitting the injector to the cylinder head.

7.1 Seal Replacement Tools - Combustion Chamber Sealing Ring (Teflon Ring)

7.1.1 The installation tools required for the combustion chamber sealing ring are listed as follows:

a) 5 Assembly Cone
b) 6 Assembly Sleeve (No.1)
c) 7 Calibration Sleeve (No.2)
d) 8 Calibration Sleeve (No.3)
e) 11 Spacer Sleeve

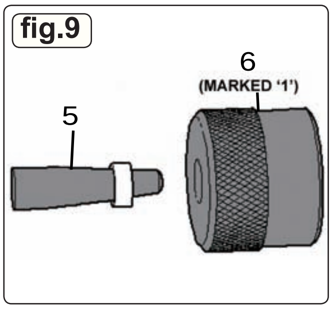


fig.9

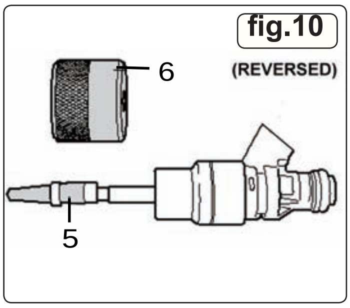


fig.10

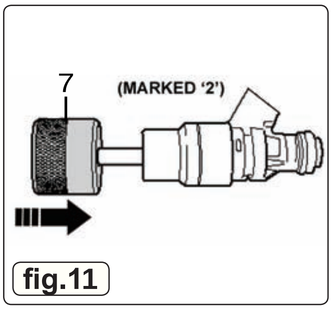


fig.11

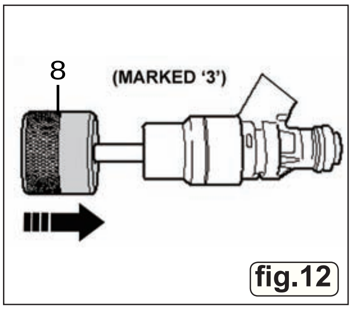


fig.12

7.2 Removing Old Ring

7.2.1 Carefully remove the old tefon ring (cut with razor blade or lever off with suitable screwdriver), and check that the groove for the ring and the continuous ridge at the bottom of the groove, are not damaged.
Note: The injector must be replaced if the groove is damaged.

7.2.2 Clean off any combustion residue in the groove or on the injector shaft using a clean cloth only.

7.3 Ring Installation

7.3.1 Push the new tefon ring onto 5 Assembly Cone using 6 Assembly Sleeve (No.1) with the knurled side of the Sleeve facing towards the ring (fig.9).

7.3.2 Now turn the sleeve around (knurled side facing away from the ring) and use it to slide the ring smoothly off the cone into the groove in the injector. **DO NOT** use any lubricants (fig.10).

7.3.3 The teflon ring is expanded as it is installed on the Assembly Cone and fitted into the groove, and therefore must be compressed in a two stage procedure, after it is fitted in the groove.

7.3.4 Stage 1 - Using 7 Calibration Sleeve (No.2), slide the Sleeve over the injector shaft whilst simultaneously rotating it 180°, inserting it as far as it will go applying moderate force only. Then pull the Sleeve back, again rotating it 180° (fig.11).

7.3.5 Stage 2 - Using 8 Calibration Sleeve (No.3), slide the Sleeve over the injector shaft whilst simultaneously rotating it 180°, inserting it as far as it will go applying moderate force only. Then pull the Sleeve back, again rotating it 180° (fig.12).

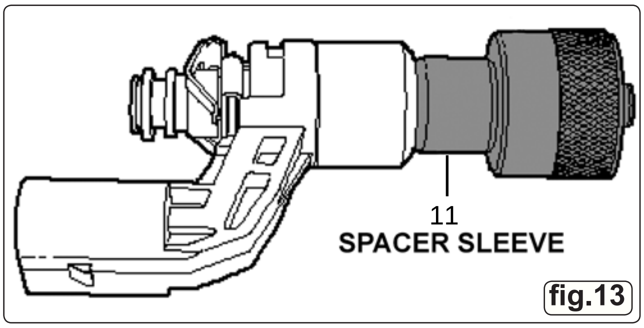


fig.13

7.3.6 Some engine applications use the 11 Spacer Sleeve in conjunction with the 7 and 8 Calibration Sleeves during the tefon ring compression stages - Example 1.4FSi and 3.6 V6 FSi Engines (fig.13).

7.4 Seal Replacement Tools - Spacer Ring and 'O' Ring (fuel rail seal)

7.4.1 Replacement of the Spacer Ring and 'O' Ring are very straightforward on many injectors.
Note: Apply a thin coating of clean engine oil on the new fuel rail 'O' Ring prior to installing it on to the injector.

7.4.2 Some injectors have a retaining spring and special tools from the CT3506 Kit (as listed below) are required to fit the support ring to the correct depth - Example 3.6 V6 FSi engines (fig.14).
a)12 Locking Plate
b) Assembly Cone
c) 14 Calibration Sleeve (Single Knurl)
d) 17 Calibration Sleeve (Double Knurl)

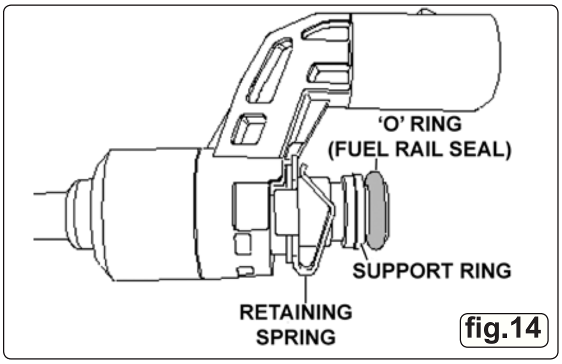


fig.14

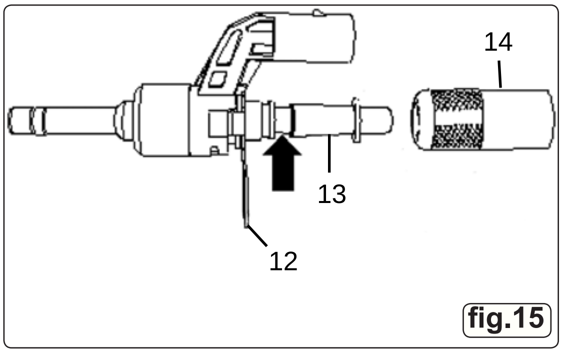


fig.15

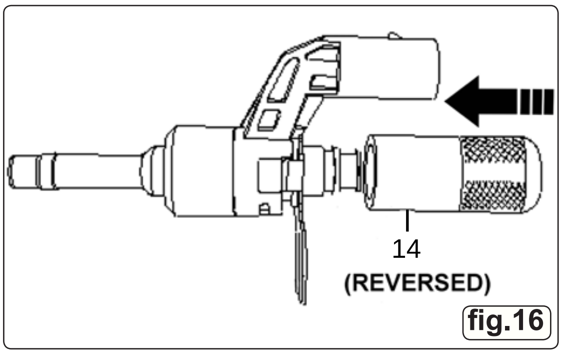


fig.16

7.4.3 Fit Locking Plate 12 in place of the retaining spring. Push the new support ring on to 13 Assembly Cone and fit the Assembly Cone onto the injector. Using 14 (with the knurled end facing the support ring) push the ring into the first groove (fig.15).

7.4.4 Remove the Assembly Cone.

7.4.5 Remove and turn around the Calibration Sleeve (knurled end facing away from the support ring) and push the support ring until it contacts the 12 Locking Plate (fig.16).

7.4.6 Remove the Calibration Sleeve and Locking Plate.
Note: Always use a new retaining spring if injectors are removed.

7.4.7 Fit the retaining spring, apply clean engine oil to the new 'O' Ring (fuel rail seal) and fit against the support ring.

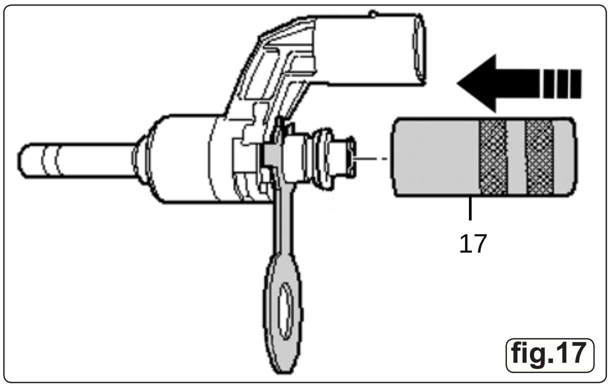


fig.17

7.4.8 Some injectors require the use of 17 Calibration Sleeve in place of the 14 Sleeve to set the support ring to the correct installation depth - Example 1.4FSi engines (fig.17).

Note: Always ensure you consult the workshop instructions for the specific engine being worked on, to identify the appropriate tools required.

8. INJECTOR INSTALLATION

8.1 Cleaning

8.1.1 Prior to installing injectors thoroughly clean all recesses and injector location holes in the cylinder head using the 4 Cleaning Brush supplied in the kit (fig.18).

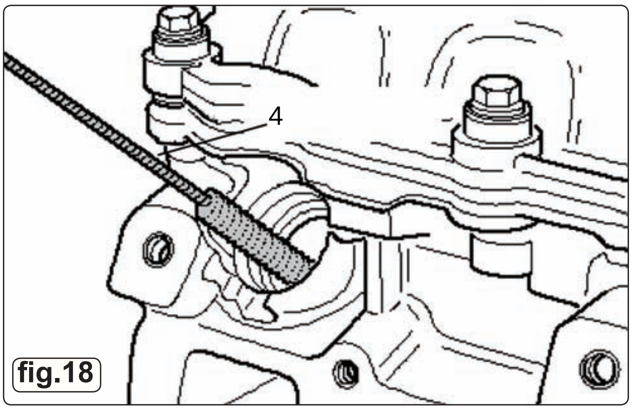


fig.18

8.2 Installation Tools - Injectors

8.2.1 The injector installation tools available with the kit are listed as follows:

a) 4 Cleaning Brush
b) 9 Injector Installer

Note: It is often possible to install injectors by using the Slide Hammer and Remover Adaptor (fig.19), which were used for removal, and carefully and lightly tapping the injector in (reverse of removal).

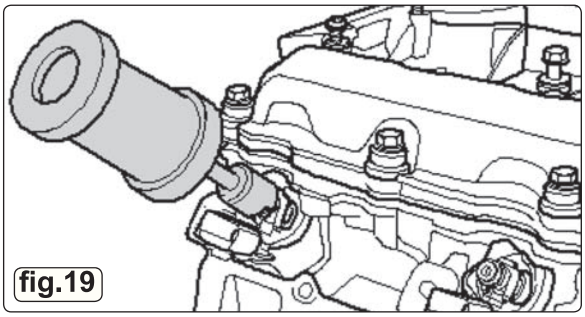


fig.19

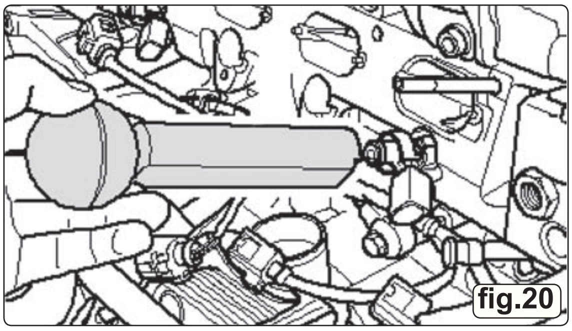


fig.20

8.3 Installing Injectors

8.3.1 Initially install injectors by hand into the cylinder head. **DO NOT** use grease or oil and ensure there is no cleaning or lubrication fluid in the bores.

8.3.2 Ensure that the injectors are seated properly and if necessary use 9 Installer (fig.20).

IMPORTANT! It is vital to ensure that the ridge in the base of the electrical connector seats into the cut-out in the cylinder head. It should not be possible to rotate the injectors more than 5° if they are seated correctly.

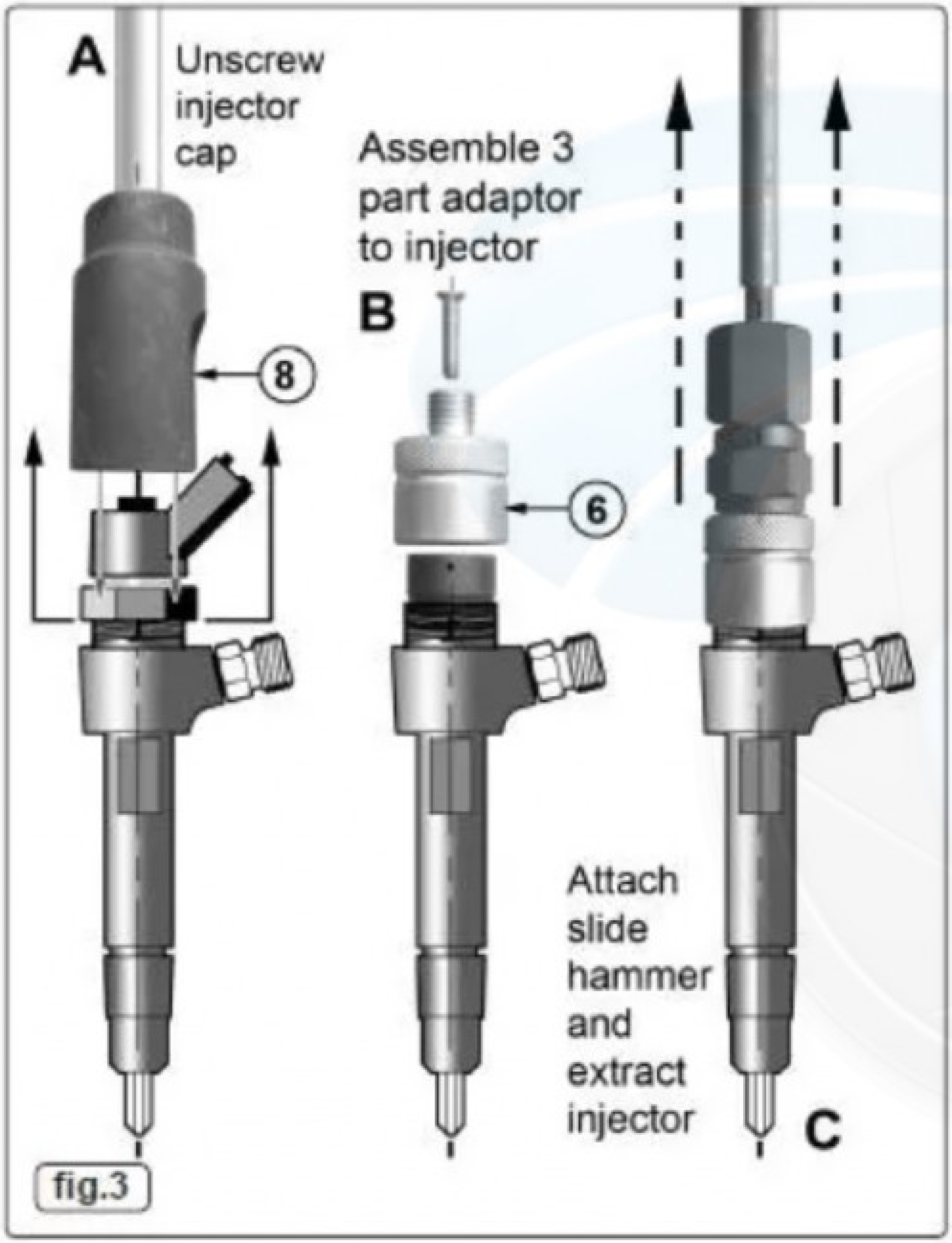


fig.3

A Unscrew injector cap

B Assemble 3 part adaptor to injector

C Attach slide hammer and extract injector

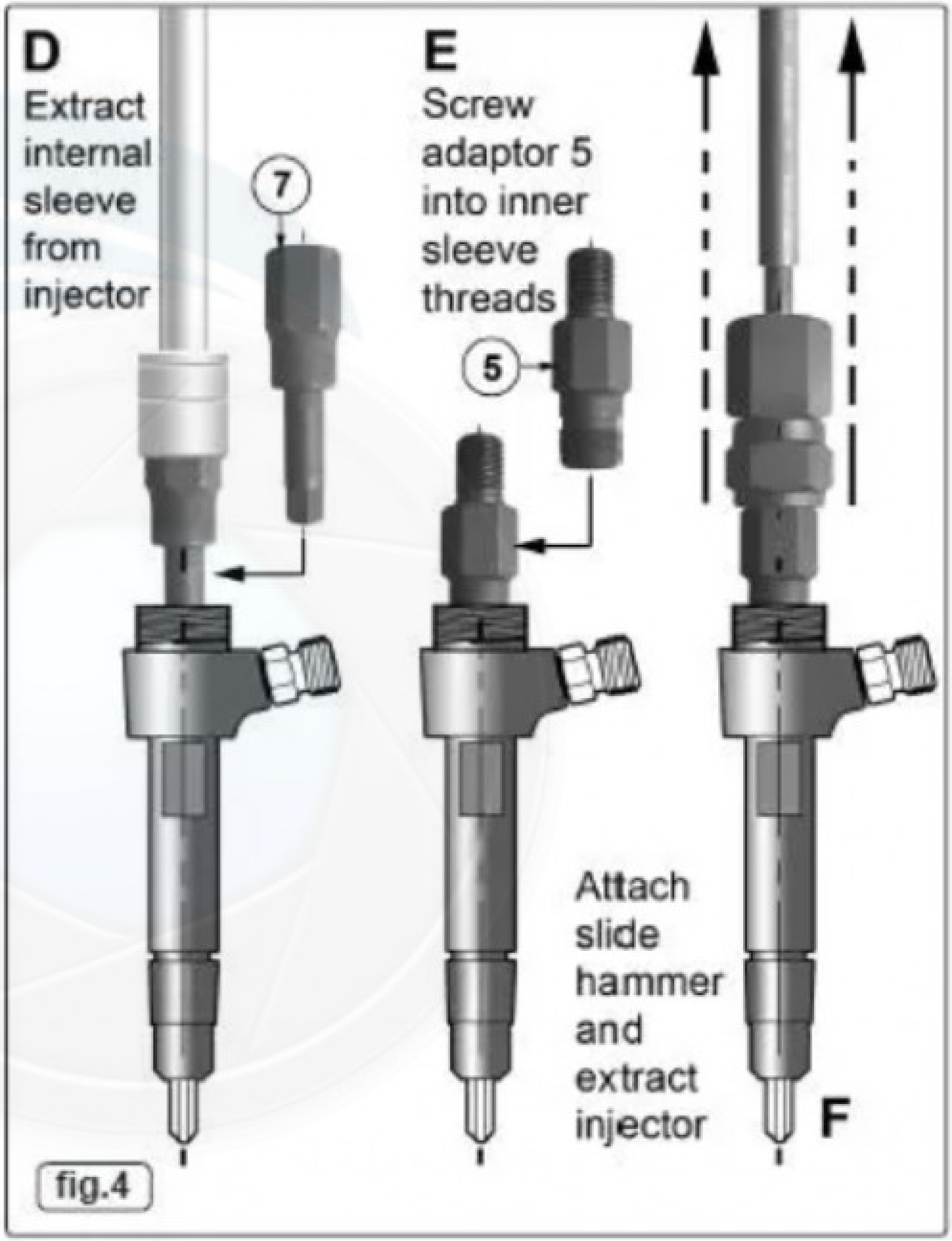
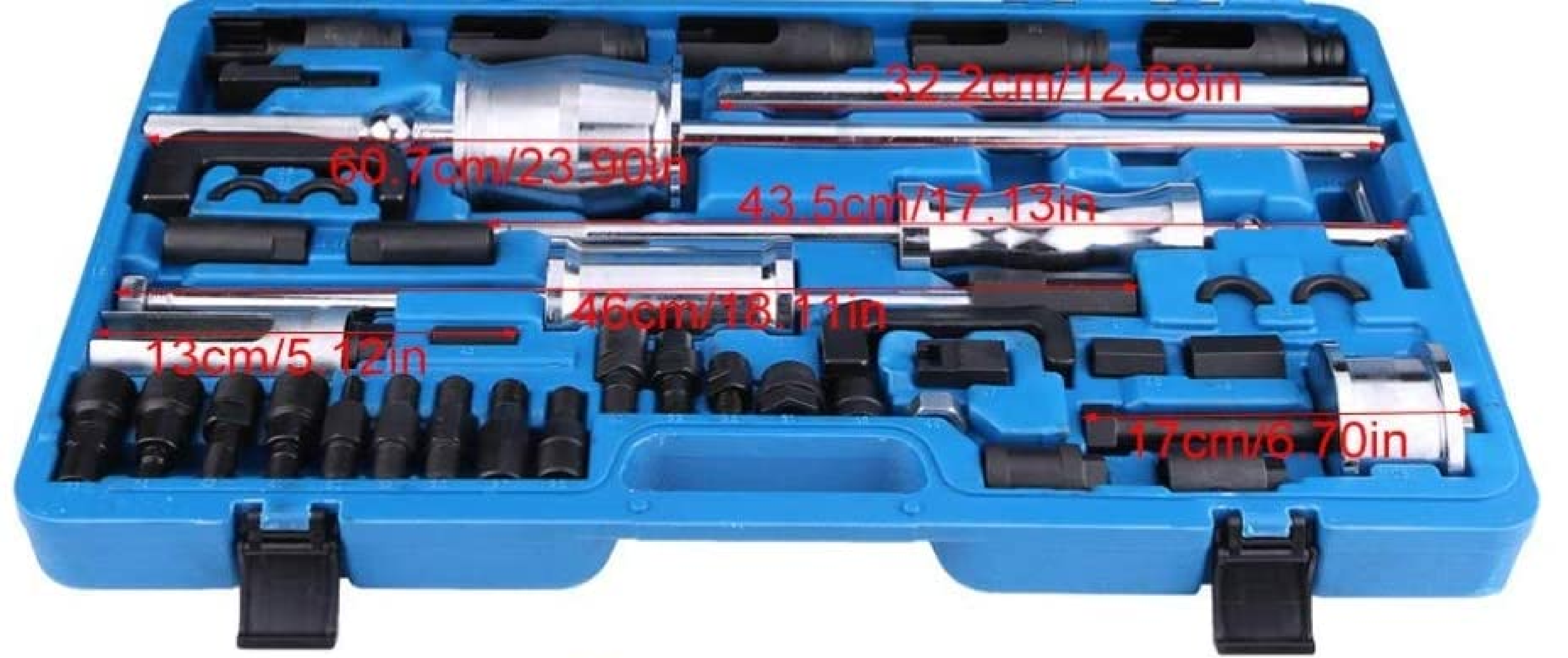


fig.4

D Extract internal sleeve from injector

E Screw adaptor 5 into inner sleeve threads

F Attach slide hammer and extract injector


32.2cm/12.68in
60.7cm/23.90in
43.5cm/17.13in
46cm/18.11in
13cm/5.12in
17cm/6.70in

10cm/3.94in
62cm/24.41in
37.4cm/14.72in

24
43
23
33
34
42
41
50
32
26
21
25

28mm
Cr-V
17mm
Cr-V
25mm
Cr-V
01
03
05
12
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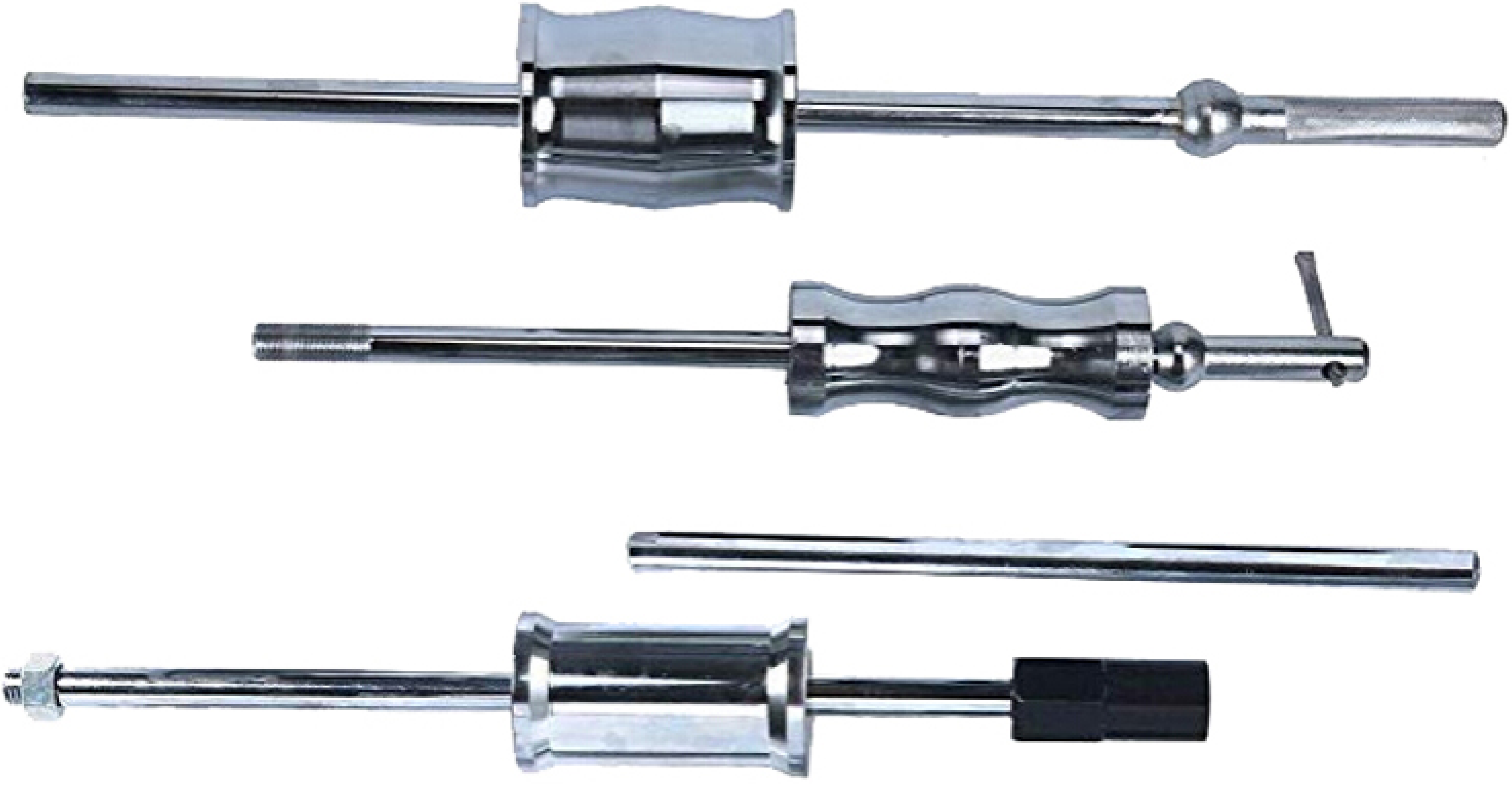

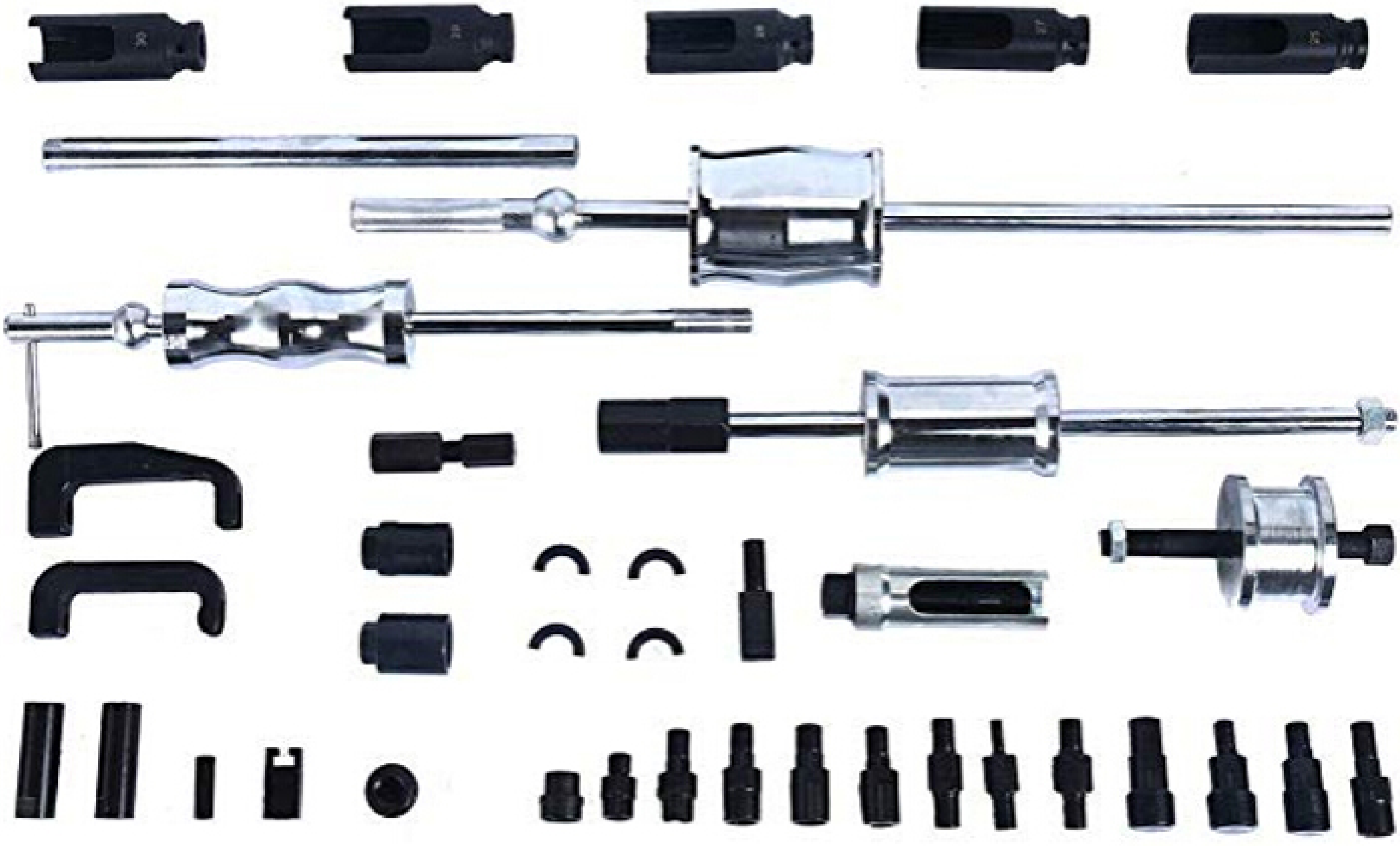

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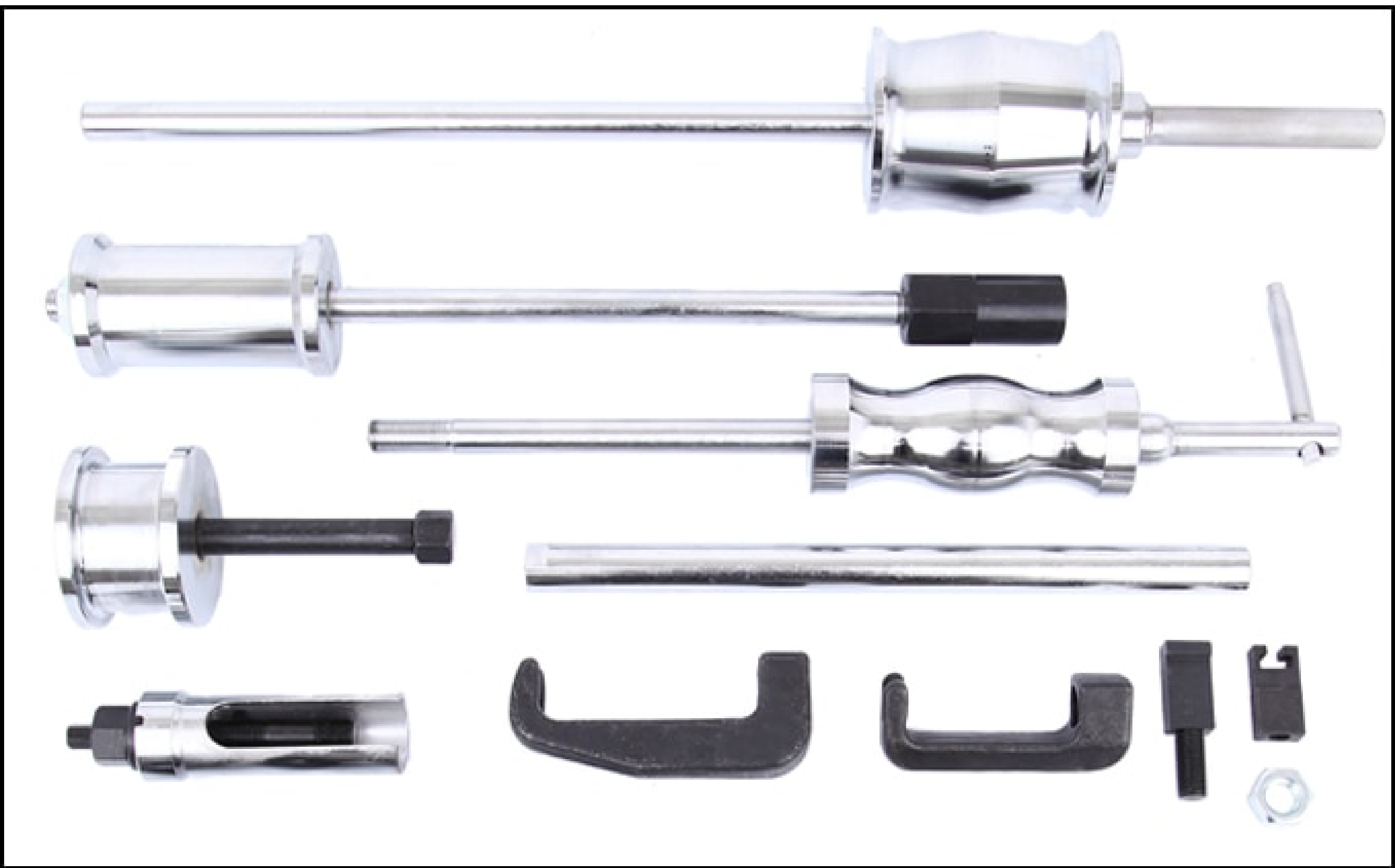

30mm Cr-v
29mm Cr-v
28mm Cr-v

27
28
25
30

30mm
Cr-v
29mm
Cr-v
28mm
Cr-v
25mm

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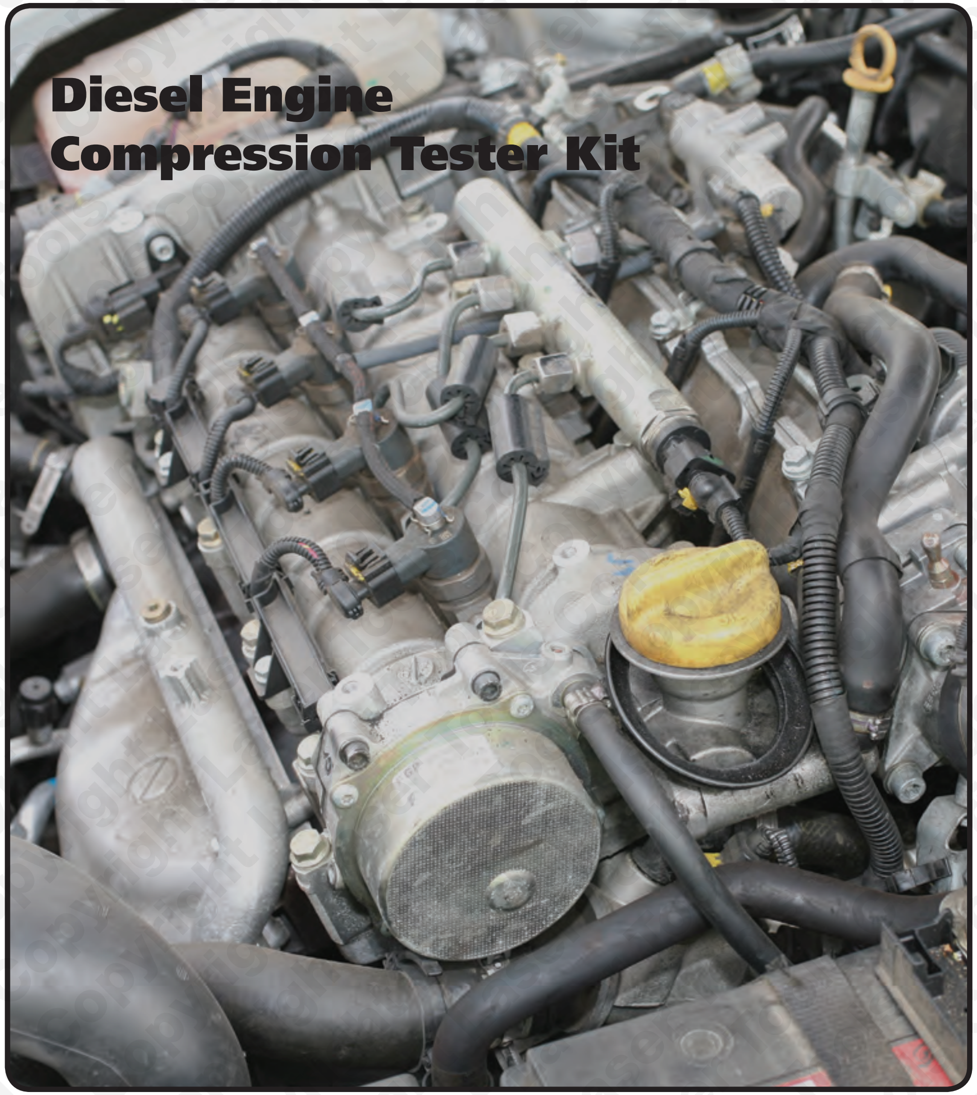

Diesel Engine Compression Tester Kit

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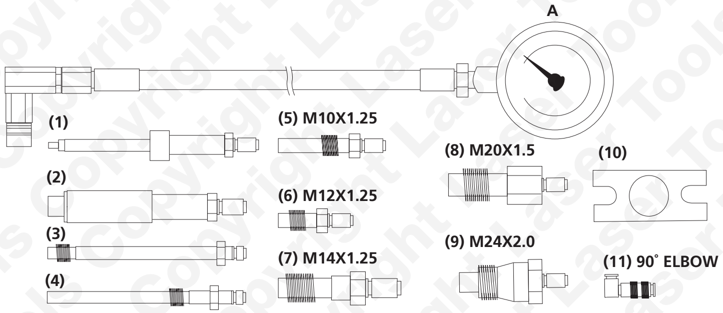
Plan Layout



Contents

Item	Description	Overall Length	Gauge Diameter	Scale
A	Gauge Assembly	560	83	0-1000 psi/0-70Kgcm
Item	**Description**	**Overall Length**	**Thread**	**Outside Diameter**
1	Stanadyne Dummy	112	N/A	19
2	Dummy Injector	114	N/A	21
3	Glow Plug Adaptor	114.5	M10 x 1.25	
4	Glow Plug Adaptor	119	M10 1.0	
5	Glow Plug Adaptor	73.5	M10 x 1.25	
6	Glow Plug Adaptor	54	M12 x1.25	
7	Glow Plug Adaptor	72	M14 x 1.25	
8	Dummy Injector	78	M20 x 1.5	
9	Dummy injector	64	M24 x 2.0	
Item	**Description**	**Length**	**Width**	**Hole Diameter**
10	Clamp Plate	63.5	25	17
11	90° Elbow			

Applications

BMW, Citroën, Dacia, Daihatsu, Fiat, Ford, Isuzu, Land Rover, Leyland Daf, Mazda, Mercedes-Benz, Mitsubishi, Nissan, Opel, Peugeot, Renault, Rover, Seat, Toyota, Vauxhall, Volkswagen, Volvo

Glow Plug	Vehicle Manufacturer
1	Ford Transit
2	Ford Transit
4	General Motors | Isuzu | Land Rover
6	Alfa Romeo | Bedford | BMW | Citroën | Fiat | Ford | Mercedes-Benz | Opel Peugeot Renault | Seat | Vauxhall
7	Citroën | Fiat | Land Rover | Opel
9	Audi | Citroën | Ford | Mercedes-Benz | Opel | Peugeot | Renault | Vauxhall Volkswagen | Volvo

Instruction

The Laser Diesel Engine Compression Test Kit 2596 is a comprehensive tool kit for checking the condition of diesel engines on most cars and small boats fitted with diesel engines.

It tests for compression loss resulting from worn valves and valve seats, valve guides, piston rings, cylinder head and gasket seals.

Test Procedure

Check the battery condition before cranking tests. Approx. 8-10 cranking cycles should be enough to indicate the cylinder pressure. For running tests, start the engine and perform the compression test at idle or full revs if required.

CHECK MANUFACTURERS SPECIFICATION AGAINST RESULTS.

This method is the preferred test method as it avoids damage to the injector and fuel system contamination.

1. Run the engine and warm up to normal running temperature
2. Disconnect the supply to the heater plug relay, remove glow plug from cylinder and fit the appropriate dummy glow plug.
3. When cranking the engine stop the fuel supply by either disconnecting the fuel pump solenoid or manually by using the PULL TO STOP knob. (When running tests are required unfasten the fuel line from the appropriate injector and fit the plastic hose over the end to re-direct the fuel into a suitable container.
4. Couple the tester assembly on to the dummy glow plug
5. In order to repeat the test on the same cylinder, the gauge pressure can be released by pressing the relief valve button.
6. To repeat the test on other cylinders, stop the engine and connect as appropriate.

A comparison of pressure readings from each cylinder is a better guide to condition of valves or piston rings than a single cylinder test.

Included in the test kit is a precision gauge, conforming to BS 1780, with a range of 0 - 1000 psi and 0 - 70 kg/cm. It has a rubber shroud for durability and to protect against damage. The gauge incorporates an exhaust valve to enable repetitive tests to be carried out without the need to remove the gauge.

A range of dummy injectors and glow plugs covers most European and Japanese vehicles, which are connected to the gauge by a quick release system.

IMPORTANT: Always wear eye and hand protection when using the Laser Diesel Engine Compression Test Kit.

DUMMY INJECTOR METHOD

1. Run engine to normal operating temperature
2. Remove the appropriate injector. Fit the plastic pipe over the fuel line to redirect the fuel into a suitable container
3. When a crank test is required ensure the battery is fully charged as this could influence the results.
4. Crank the engine to clear away the port
5. Place the correct dummy injector in position using the clamp plate to ensure the mating faces are sealed.
   DO NOT OVER TIGHTEN
6. Couple the tester assembly on to the dummy injector
7. Start or crank the engine and perform the test – reading the display for the compression of that cylinder.
8. In order to repeat the test on the same cylinder, the gauge pressure can be released by pressing the relief valve button.
9. To repeat the test on other cylinders, stop the engine and reconnect as appropriate.

How to diagnose faults:

Check the pressure reading for each cylinder against the specification laid down by the engine or vehicle manufacturer in the workshop manual. Also, compare the pressure reading from each cylinder with all other cylinders.

If the pressure varies from the specified figure by more than 44 psi, the engine has a fault. Most diesel engines should give a pressure reading of about 308 psi, but check the manufacturer’s workshop manual to obtain an accurate specification.

If the compression pressure is low, the fault may be:

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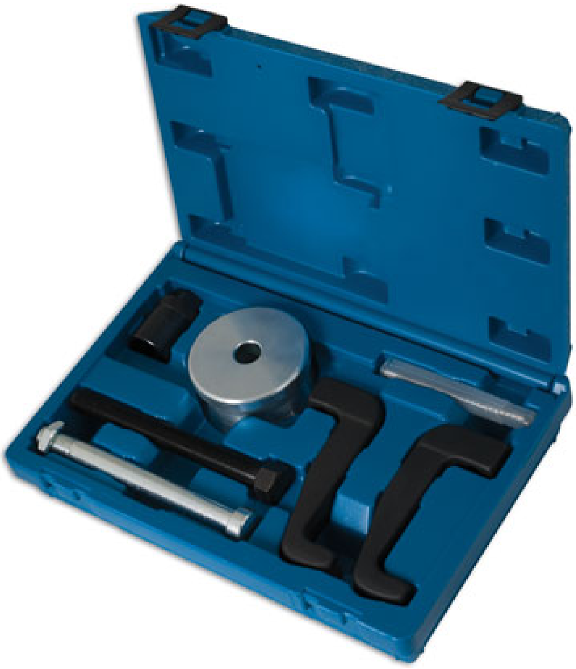
Injector Puller Set

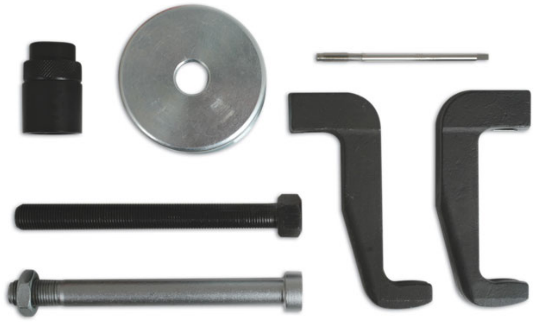
This six piece injector puller with impact weight has been specially designed for removing stubborn injectors on Mercedes-Benz CDi engines



Additional Information

- On some applications the injectors need to be removed to gain access to the cam cover.
- A high quality tap is also included for rethreading or cleaning the bracket used to keep the injector in place.
- Internal and external forks are included for drawing out the injector.
-
-

http://lasertools.co.uk/product/4335



SAFETY INSTRUCTIONS

1. WARNING! Ensure all Health and Safety practices are strictly adhered to when using this product.
2. Compression tests on diesel engines should be conducted when the engine is cold.
3. Use proper ventilation and avoid breathing in exhaust fumes.
4. Keep a fire extinguisher to hand
5. Fuel delivery must be prevented by either operating the engine stop lever or disconnecting fuel pump solenoid.
6. Ensure you keep tester at arms length when relieving pressure to avoid personal injury.
7. Protect your hands from burns as quick release coupling and adaptors may become hot during use.
8. Account for all the tools and parts being used and do not leave them in, on or near the engine after use.
9. DO NOT remove the compression test equipment while engine is being cranked.
10. Maintain tools in good and clean condition for best and safest performance.
11. DO NOT use test kit if damaged. Wear suitable clothing to avoid snagging.
12. DO NOT wear jewellery and tie back long hair.

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Guarantee

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4510

LASER®

Diesel Engine Compression Tester Kit

Instructions

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Diesel Engine Compression
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Diesel Engine Compression Tester
Claw and Clamp Adaptor Set

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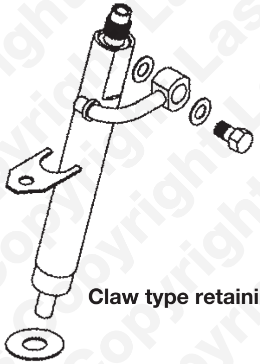
Diesel Engine Compression Tester Kit

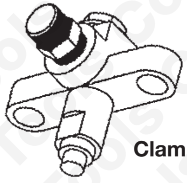
This comprehensive Diesel Engine Compression Tester kit covers a vast majority of modern engines fitted to most manufacturers' vehicles.
A large 2.5 gauge with 0-70 kg/cm^2 or 0-1000psi coiled rubber hose with right angled connection and a wide selection of glow plug and injector adaptors in claw and clamp on application.

Instructions

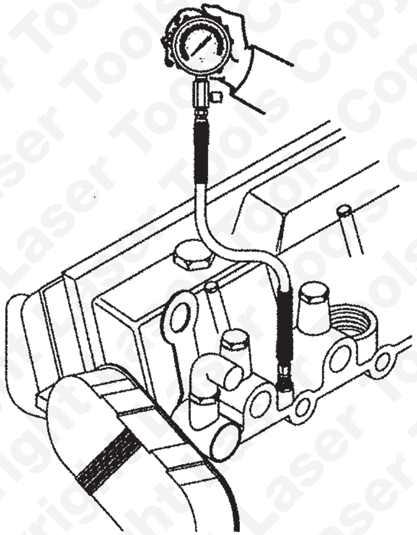
1. Select the appropriate dummy glow plug or injector adaptor
2. Remove the glow plug and replace
3. Connect the Tester with the quick coupler
4. Crank the engine and observe the gauge.
5. When the maximum has been reached, stop cranking
6. Note down the reading
7. Depress the Re-test valve to relieve pressure
   (take care as the pressure released is high)
8. Repeat test until all cylinders have been tested
9. Compare readings and consult workshop manual for diagnostics.



Claw type retaining clamp



Clamp type injector



Applications

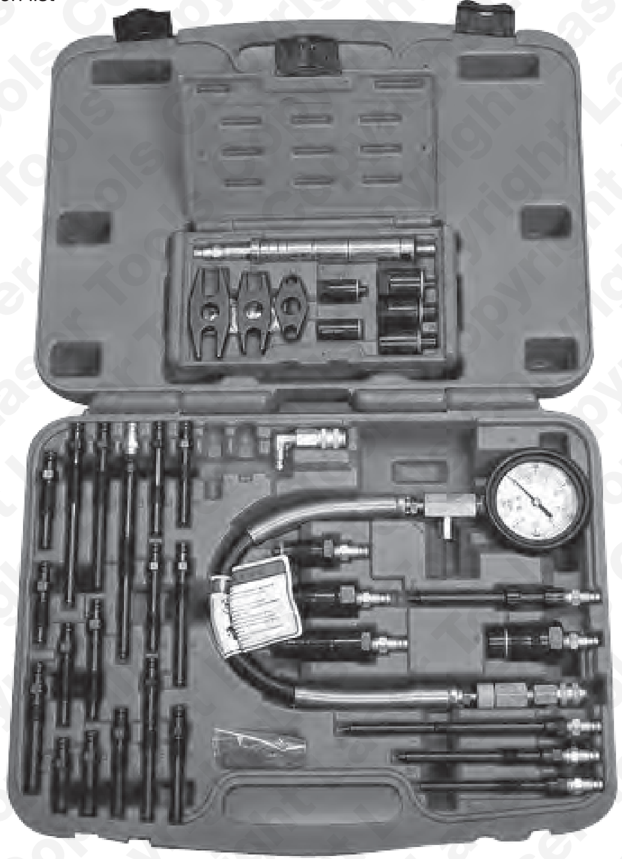
VOLKSWAGEN	TRANSPORTER T4	1.9	T4	1X	90 TO 95	M12X1.25	1
VOLKSWAGEN	TRANSPORTER T4	1.9	T4	ABL	92 TO 02	M12X1.25	1
VOLKSWAGEN	TRANSPORTER T4	2.4	T4	AAB, AJA	92 TO 03	M12X1.25	1
VOLKSWAGEN	SHARAN 1	2.5	T4	ACV	97 TO 03	M10X1.0	12
VOLKSWAGEN	SHARAN 1	2.5	T4	AHY, AJT, AUF,AYC,AYY	98 TO 03	M10X1.0	12
VOLKSWAGEN	TRANSPORTER T5	1.9	85-105	AXB, AXC	03 ON	M10X1.0	13
VOLKSWAGEN	TRANSPORTER T5	2.5	T5 130-174	AXD, AXE	03 ON	M10X1.0	13
VOLKSWAGEN	VENTO	1.9	TD	1Y, AAZ	92 TO 98	M12X1.25	1
VOLKSWAGEN	SHARAN 1	1.9	TDI	1Z, AHU, AFN, AJM	94 ON	M10X1.0	12
VOLVO	200 SERIES				TO 81	M12X1.25	2
VOLVO	200 SERIES				81 ON	M12X1.25	1
VOLVO	340				84 ON	M12X1.25	1
VOLVO	360				84 ON	M12X1.25	1
VOLVO	440	1.9	TURBO	F8Q TURBO	94 TO 97	M12X1.25	2
VOLVO	460	1.9	TURBO	D 19 T	94 TO 97	M12X1.25	2
VOLVO	740			D24, D24T	84 TO 91	M12X1.25	1
VOLVO	760			D24, D24T	84 TO 91	M12X1.25	1
VOLVO	850		TURBO	D5252 (Audi)	95 TO 97	M10X1.0	12
VOLVO	940		TURBO	D24T	90 TO 96	M12X1.25	1
VOLVO	S40	1.9	TURBO	D4192T F8Q (Renault)	96 TO 99	M12X1.25	2
VOLVO	S40	1.9	DI	D4192T 2 F9Q (Renault)	99 TO 00	M10X1.0	12
VOLVO	850	1.9	TURBO Direct Injection	dCi (Renault)	00 ON	M10X1.0	12
VOLVO	S40	1.6			04 ON	M8X1.0	21
VOLVO	S70	2.5	TDi/D	D5252T	96 TO 00	M10X1.0	12
VOLVO	S70	2.5	TURBO	D5252T	98 ON	M10X1.0	12
VOLVO	V40	1.9	TURBO	D4192T F8Q (Renault)	96 TO 99	M12X1.25	2
VOLVO	V40	1.9	DI	D4192T 2 F9Q (Renault)	99 TO 00	M10X1.0	12
VOLVO	S70	1.9		dCi Renault	00 ON	M10X1.0	12
VOLVO	V50	2.0		D4204T	04 ON	M10X1.0	18
VOLVO	S70	2.5	TURBO	D5252T	97 TO 01	M10X1.0	12

Applications

VAUXHALL	NOVA TD	1.5	TURBO	T4EC1-AADT	88 TO 93	M10X1.25	11
VAUXHALL	OMEGA	2.0		X20DTH, X20DTL	98 ON	M10X1.0	16
VAUXHALL	OMEGA	2.0		Y20DTH	00 ON	M10X1.25	9
VAUXHALL	OMEGA	2.2		Y22DTR	00 ON	M10X1.25	9
VAUXHALL	OMEGA	2.5	TURBO		94 ON	M12X1.25	1
VAUXHALL	SIGNUM	2.0		Y20DTH	03 ON	M10X1.25	9
VAUXHALL	SIGNUM	2.2		Y22DTR	03 ON	M10X1.25	9
VAUXHALL	SINTRA	2.2		X22DTH, X22DTL	98 TO 99	M10X1.0	16
VAUXHALL	TIGRA	1.3		Z13DT	04 ON	M8X1.0	21
VAUXHALL	VECTRA B	1.7		X17TD/TC4 EE1	95 TO 96	M10X1.25	11
VAUXHALL	VECTRA B	1.7		X17TD/TC4 EE1	95 TO 96	M10X1.25	11
VAUXHALL	VECTRA B	2.0		X20DTL	96 TO 97	M10X1.0	16
VAUXHALL	VECTRA B	2.0		X20DTH, X20DTL	98 ON	M10X1.0	16
VAUXHALL	VECTRA B	2.0		Y20DTH	00 ON	M10X1.25	9
VAUXHALL	VECTRA B	2.2		Y22DTR	00 ON	M10X1.25	9
VAUXHALL	VECTRA C	1.9	CDTi 8 Valve	Z19DT	04 ON	M10X1.0	15
VAUXHALL	VECTRA C	2.0		Y20DTH	02 TO 06	M10X1.25	9
VAUXHALL	VECTRA C	2.2		Y22DTR	02 ON	M10X1.25	9
VAUXHALL	VIVARO	1.9	DTi	F9Q770	01 ON	M10X1.0	12
VAUXHALL	VIVARO	2.5			03 ON	M10X1.0	20
VAUXHALL	ZAFIRA	2.0		X20DTH, X20DTL	99 TO 00	M10X1.0	16
VAUXHALL	ZAFIRA	2.0		Y20DTH	00 ON	M10X1.25	9
VAUXHALL	ZAFIRA	1.9	CDTi 8	Z19DT	05 ON	M10X1.0	15
VOLKSWAGEN	ALL DIESEL	All			TO 80	M12X1.25	2
VOLKSWAGEN	ALL DIESEL (80→93)	All			80 TO 93	M12X1.25	1
VOLKSWAGEN	BORA	1.9		AGP, AGR, AHF, AJM, ALH	99 ON	M10X1.0	12
VOLKSWAGEN	BORA	1.9		ANU, AQM, ASV, AUY	99 ON	M10X1.0	12
VOLKSWAGEN	BORA	1.9	UP TO CHASSIS. 1J-2-600000	ARL, ASZ, ATD, AXR	00 ON	M10X1.0	12
VOLKSWAGEN	BORA	1.9	FROM CHASSIS. 1J-2-600000	ARL, ASZ, ATD, AXR	00 ON	M10X1.0	13
VOLKSWAGEN	BEETLE	1.9		ALH, ATD	00 ON	M10X1.0	12
VOLKSWAGEN	CADDY Mk1	1.6		JK, ME	82 TO 96	M12X1.25	1
VOLKSWAGEN	CADDY Mk2	1.9		1Y, AEF	96 ON	M12X1.25	1
VOLKSWAGEN	BEETLE	1.9	Sdi	AEY,AGD,AHU,ALE,ALH,AYQ	96 ON	M10X1.0	12
VOLKSWAGEN	CADDY Mk3	2.0		BDJ, BST	04 ON	M10X1.0	13
VOLKSWAGEN	GOLF Mk2 (84→91)	1.6	All Engine Codes	1V,CK,CR,CY,JK,JP,JR,RA,SB	84 TO 91	M12X1.25	1
VOLKSWAGEN	GOLF Mk3 (91→98)	1.9	NON TURBO	1Y	91 ON	M12X1.25	1
VOLKSWAGEN	BEETLE	1.9	NON TURBO	AEY	95 ON	M10X1.0	12
VOLKSWAGEN	BEETLE	1.9	75bhp / 55kW TD	AAZ	91 ON	M12X1.25	1
VOLKSWAGEN	BEETLE	1.9	Incl. TDI	1Z, AFN, AHU,ALE	93 ON	M10X1.0	12
VOLKSWAGEN	GOLF Mk4	1.9		AGP, AGR, AHF, AJM, ALH	97 ON	M10X1.0	12
VOLKSWAGEN	GOLF Mk4	1.9		ANU, AQM, ASV, AUY, AVG	97 ON	M10X1.0	12
VOLKSWAGEN	GOLF Mk4	1.9	UP TO CHASSIS. 1J-2-600000	ARL, ASZ, ATD, AXR	00 ON	M10X1.0	12
VOLKSWAGEN	GOLF Mk4	1.9	FROM CHASSIS. 1J-2-600001	ARL, ASZ, ATD, AXR	00 ON	M10X1.0	13
VOLKSWAGEN	JETTA	1.6	All Engine Codes	1V,CK,CR,CY,JK,JP,JR,RA,SB	84 TO 91	M12X1.25	1
VOLKSWAGEN	LT 1 (→08/96)	2.4	All models	Turbo /Non Turbo	78 TO 96	M12X1.25	1
VOLKSWAGEN	LT 2	2.5	Incl. Sdi	AGX,AHD,ANJ,APA	96 ON	M10X1.0	12
VOLKSWAGEN	LT 2	2.5		AVR,BBE,BBF	96 ON	M10X1.0	12
VOLKSWAGEN	LUPO	1.4	UP TO CHASSIS 6X-2-005 000	AMF	00 ON	M10X1.0	12
VOLKSWAGEN	LUPO	1.4	FORM CHASSIS 6X-2-005 001	AMF	00 ON	M10X1.0	13
VOLKSWAGEN	LUPO	1.7		AKU	99 ON	M10X1.0	12
VOLKSWAGEN	PASSAT	1.6	Incl. TURBO	CR,CY,JK,RA,SB	84 TO 93	M12X1.25	1
VOLKSWAGEN	PASSAT	1.9	Incl. TURBO	1Y, AAZ	89 TO 96	M12X1.25	1
VOLKSWAGEN	LUPO	1.9	TURBO	1Z, AFN, AJM, AHU	89 ON	M10X1.0	12
VOLKSWAGEN	PASSAT	1.9	TURBO	AFN,AHH,AHU,AJM,AYJ,AUG	96 ON	M10X1.0	12
VOLKSWAGEN	PASSAT	2.5	V6 TDI	AFB, AKN	98 ON	M10X1.0	17
VOLKSWAGEN	PASSAT	1.9	UP TO CHASSIS. 3B-2-350-000	AVB, AVF, ATJ, AWX	00 ON	M10X1.0	12
VOLKSWAGEN	PASSAT	1.9	FROM CHASSIS 3B-2-350-001	AVB, AVF, AWX	00 ON	M10X1.0	13
VOLKSWAGEN	PASSAT	2.5	V6 TDI	AFB,AKN,BAU,BDG,BDH	00 ON	M10X1.0	17
VOLKSWAGEN	PHAETON	5.0		AJS	03 ON	M10X1.0	13
VOLKSWAGEN	POLO Mk4	1.9	64bhp / 47kW	AEF	96 ON	M12X1.25	1
VOLKSWAGEN	PASSAT	1.9		AEY, AHU	95 TO 99	M10X1.0	12
VOLKSWAGEN	POLO Mk5	1.4		AMF	00 ON	M10X1.0	12
VOLKSWAGEN	POLO Mk5	1.9		ASX	99 ON	M10X1.0	12
VOLKSWAGEN	POLO Mk6	1.4		BAY	02 ON	M10X1.0	12
VOLKSWAGEN	POLO Mk6	1.9	SDi	ASY	02 ON	M10X1.0	13
VOLKSWAGEN	POLO Mk6	1.9	TDi	ATD, AXR, BLT	02 ON	M10X1.0	13
VOLKSWAGEN	SHARAN 1	1.9		1Z, AHU, AFN, AVG	95 TO 00	M10X1.0	12
VOLKSWAGEN	SHARAN 1	1.9	UP TO CHASSIS. 7M-2-030-004	ANU, AUY	99 ON	M10X1.0	12
VOLKSWAGEN	SHARAN 1/2	1.9	FROM. 7M-2-030-004	ANU, AUY	99 ON	M10X1.0	13
VOLKSWAGEN	SHARAN 2	1.9		ASZ, BVK	00 ON	M10X1.0	13
VOLKSWAGEN	TOUAREG	2.5		BAC, BLK	03 TO 06	M10X1.0	13
VOLKSWAGEN	TOUAREG	5.0		AYH	03 TO 06	M10X1.0	13
VOLKSWAGEN	TRANSPORTER T3	1.6	T3		81 TO 90	M12X1.25	1
VOLKSWAGEN	TRANSPORTER T3	1.7	T3	KY	86 TO 90	M12X1.25	1

Contents

- 0-1000 psi (0-70 kg/cm^2) 2 ½ Gauge with rubber bumper
- 90° Adaptor
- 20 x Dummy Glow plugs
- 5 x Injector Adaptors
- 2 x Packs Spare Seals | Washers and nozzle
- 1 x Clamp and Claw Adaptor Set
  Six clamp-on injector adaptors suitable for Car | Van | Truck | Bus | Agricultural & Marine injector sizes. Suitable for use where injector is held in place by clamp | claw | bridge. Collar system allows easy matching of injector profile.
- Full application list clamp | claw | bridge.
  Collar system allows easy matching of injector profile.
- Full application list



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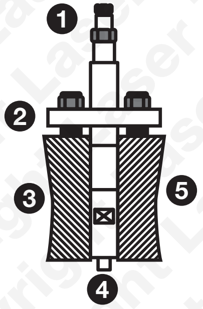
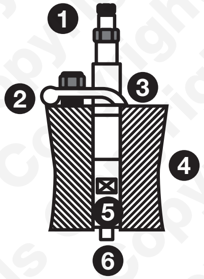
Dummy injector simulating a clamp-type injector

1. Pillar bridge piece
2. Cylinder Head
3. Sealing Washer
4. Spacers
5. Nozzle Adaptors



1. Pillar
2. Engine Manufacturer's injector Clamp (claw)
3. Spacers
4. Cylinder Head
5. Nozzle Adaptors
6. Sealing Washer

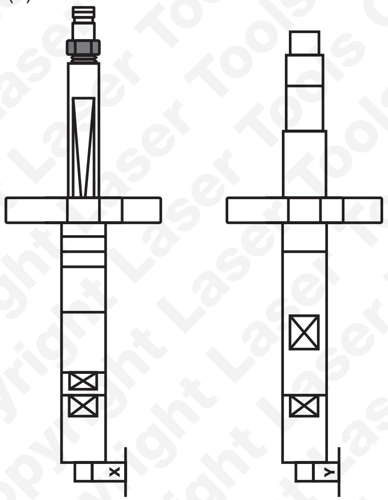


Claw held injectors - use the actual injectors clamp

NOTE: Use large diameter spacer in top position for wider claws

With the appropriate Nozzle Adaptor screwed to the Pillar Assembly and with Spacers and Bridge piece added you can duplicate the profile of the original injector.
IMPORTANT: Depth (X) not to exceed depth (Y)

1. Bridge piece
2. Spacers
3. Nozzle Adaptors
4. Original injector



Applications

TOYOTA	HI-LUX	2.4		2L	91 ON	M10X1.25	7
TOYOTA	HI-LUX	2.4	TURBO	2L-T	97 ON	M10X1.25	7
TOYOTA	HI-LUX	2.5	TURBO	2KDFTV	01 ON	M10X1.25	10
TOYOTA	LANDCRUISER	3.0	D-4D	1KD-FTV	03 ON	M10X1.25	10
TOYOTA	LANDCRUISER	4.0		2H	TO 82	M10X1.25	4
TOYOTA	LANDCRUISER	4.0		2H	82 ON	M10X1.25	4
TOYOTA	LANDCRUISER	4.2		1HD-T	95 TO 96	M10X1.25	9
TOYOTA	LANDCRUISER	4.2	AMAZON	1HD-T	97 TO 98	M10X1.25	9
TOYOTA	PREVIA	2.0	D-4D	1CD-FTV	01 ON	M10X1.25	10
TOYOTA	RAV 4 Mk2	2.0	D-4D	1CD-FTV	01 ON	M10X1.25	10
VAUXHALL	ARENA	1.9		F8Q 600, F8Q 606	98 TO 00	M10X1.0	13
VAUXHALL	ARENA	2.5		S8U 758	97 TO 00	M12X1.25	1
VAUXHALL	ASTRA	1.6			87 TO 88	M12X1.25	1
VAUXHALL	ASTRA	1.7	NON TURBO	GM (Vauxhall Engine)	89 TO 91	M12X1.25	1
VAUXHALL	ASTRA	1.7	TURBO	GM (Vauxhall Engine)	89 TO 91	M12X1.25	1
VAUXHALL	ASTRA	1.7	1.7D & 1.7DTL	GM (Vauxhall Engine)	92 TO 97	M12X1.25	1
VAUXHALL	ASTRA	1.7	TD	TC4EE1	92 TO 97	M10X1.25	11
VAUXHALL	ASTRA	1.7	TD	TC4EE1	92 TO97	M10X1.25	11
VAUXHALL	ASTRA	1.7	TD	TC4EE1	92 TO 97	M10X1.25	11
VAUXHALL	ASTRA G	1.7	TD 8 VALVE	X17DTL	98 TO 00	M12X1.25	1
VAUXHALL	ASTRA G	1.7	16 VALVE	Y17DT	00 ON	M10X1.25	9
VAUXHALL	ASTRA G	2.0	DI & DTI	X20DTH, X20DTL	98 ON	M10X1.0	16
VAUXHALL	ASTRA G	2.0		Y20DTH	00 ON	M10X1.25	9
VAUXHALL	ASTRA H	1.3		Z13DT	05 ON	M8X1.0	21
VAUXHALL	ASTRA H	1.7	16 VALVE	Z17DTH, Z17DTL	04 ON	M10X1.25	9
VAUXHALL	ASTRAMAX	1.6			85 TO 89	M12X1.25	1
VAUXHALL	ASTRAMAX	1.7			89 TO 94	M12X1.25	1
VAUXHALL	ASTRAVAN	1.7	1.7D & 1.7DTL		92 TO 97	M12X1.25	1
VAUXHALL	ASTRAVAN	1.7	TD 8 VALVE ONLY	GM (Vauxhall Engine)	98 TO 00	M12X1.25	1
VAUXHALL	ASTRAVAN	1.7	16 VALVE	Isuzu	00 ON	M10X1.25	9
VAUXHALL	ASTRAVAN	2.0	DI & DTI	X20DTH, X20DTL	98 ON	M10X1.0	16
VAUXHALL	ASTRAVAN	2.0		Y20DTH	00 ON	M10X1.25	9
VAUXHALL	BELMONT	1.6			86 TO 89	M12X1.25	1
VAUXHALL	BELMONT	1.7	NON TURBO	GM (Vauxhall Engine)		M12X1.25	1
VAUXHALL	BRAVA	2.2			88 TO 90	M10X1.25	4
VAUXHALL	CARLTON	1.6				M12X1.25	1
VAUXHALL	CARLTON	2.3				M12X1.25	1
VAUXHALL	CAVALIER	1.6			87 TO 88	M12X1.25	1
VAUXHALL	CAVALIER	1.7	NON TURBO ONLY	GM (Vauxhall Engine)	89 ON	M12X1.25	1
VAUXHALL	CAVALIER	1.7	TURBO	TC4EC1	92 TO 95	M10X1.25	4 OR 11
VAUXHALL	COMBO	1.3		Z13DT, Z13DTJ	04 ON	M8X1.0	21
VAUXHALL	COMBO	1.7		X17DTL	92 TO 01	M10X1.25	11
VAUXHALL	COMBO	1.7		X17DTL	92 TO 01	M10X1.25	11
VAUXHALL	COMBO	1.7	16V	Y17DT, Y17DTL, Z17DTH	00 ON	M10X1.25	9
VAUXHALL	CORSA B	1.5		15D, 15DT	93 TO 00	M10X1.25	11
VAUXHALL	CORSA B	1.5		15D, 15DT	93 TO 00	M10X1.25	11
VAUXHALL	CORSA B	1.7	8V	X17D	94 TO 00	M10X1.25	11
VAUXHALL	CORSA B	1.7	8V	X17D	94 TO 00	M10X1.25	11
VAUXHALL	CORSA C	1.3		Z13DT, Z13DTJ	03 ON	M8X1.0	21
VAUXHALL	CORSA C	1.7	16 VALVE	Y17DT, Y17DTL, Z17DTH	00 ON	M10X1.25	9
VAUXHALL	CORSA D	1.3	16 Valve 75PS & 90PS	Z13DT	06 ON	M8X1.0	21
VAUXHALL	CORSAVAN	1.3		Z13DT	04 ON	M8X1.0	21
VAUXHALL	CORSAVAN	1.7	8V	X17D	94 TO 01	M10X1.25	11
VAUXHALL	CORSAVAN	1.7	8V	X17D	94 TO 01	M10X1.25	11
VAUXHALL	CORSAVAN	1.7	16V	Y17DT, Y17DTL	00 ON	M10X1.25	9
VAUXHALL	FRONTERA A	2.3		TURBO	91 TO 95	M12X1.25	1
VAUXHALL	FRONTERA A	2.5		25TD/TDS - VM41B	96 TO 98	M10X1.0	13
VAUXHALL	FRONTERA B	2.2	DTI	X22DTH, X22DTL	98 ON	M10X1.0	16
VAUXHALL	FRONTERA B	2.2		Y22DTH	00 ON	M10X1.25	9
VAUXHALL	MERIVA	1.3		Z13DT, Z13DTJ	05 ON	M8X1.0	21
VAUXHALL	MERIVA	1.7	16 Valve 75PS & 100PS	Y17DT, Z17DTH	03 TO 06	M10X1.25	9
VAUXHALL	MERIVA	1.7	16 Valve 125PS	Z17DTR	06 ON	M8X1.0	21
VAUXHALL	MIDI	2.0		Isuzu	88 TO 94	M10X1.25	11
VAUXHALL	MIDI	2		Isuzu	88 TO 94	M10X1.25	11
VAUXHALL	MIDI	2.2		Isuzu	88 TO 94	M10X1.25	11
VAUXHALL	MIDI	2.2		Isuzu	88 TO 94	M10X1.25	11
VAUXHALL	MONTEREY	3.1	TURBO	4JG2	94 TO 99	M10X1.25	6
VAUXHALL	MOVANO	1.9		F9Q 770	01 ON	M10X1.0	12
VAUXHALL	MOVANO	2.2		G9T 720	00 ON	M10X1.0	20
VAUXHALL	MOVANO	2.5		S8U W7	98 ON	M12X1.25	1
VAUXHALL	MOVANO	2.5	CDTI		02 ON	M10X1.0	20
VAUXHALL	NOVA	1.5		15D/CEC1	92 TO 93	M10X1.25	4 OR 11
VAUXHALL	NOVA	1.5		15 D/C EC1 AAD	97 TO 93	M10X1.25	4 OR 11
VAUXHALL	NOVA TD	1.5	TURBO	T4EC1-AADT	87 TO 93	M10X1.25	11

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Applications

SEAT	IBIZA 1&2	1.7			87 TO 93	M12X1.25	1
SEAT	IBIZA 1&2	1.9	Incl. TURBO	1Y, AAZ	93 ON	M12X1.25	1
SEAT	ALHAMBRA 2	1.9	SDi	AEY, AGP, AQM	99 ON	M10X1.0	12
SEAT	ALHAMBRA 2	1.9	TDi	1Z,AFH,AFN,AGR,AHU,ASV	96 ON	M10X1.0	12
SEAT	IBIZA 3&4	1.4		AMF	03 ON	M10X1.0	13
SEAT	ALHAMBRA 2	1.9	SDi	AGP, AQM	99 TO 03	M10X1.0	12
SEAT	ALHAMBRA 2	1.9	TDi	AGR,ALH,ALK,ASK,ASV	99 TO 02	M10X1.0	12
SEAT	ALHAMBRA 2	1.9	SDi	ASY	02 ON	M10X1.0	13
SEAT	ALHAMBRA 2	1.9	TDi	ATD	02 ON	M10X1.0	13
SEAT	ALHAMBRA 2	1.9	TDi 130	ASZ, BLT	03 ON	M10X1.0	13
SEAT	ALHAMBRA 2	1.9	Cupra R	BPX, BUK	04 ON	M10X1.0	13
SEAT	INCA	1.9	TD	1Y	95 ON	M12X1.25	1
SEAT	ALHAMBRA 2	1.9	SDi	AEY, AYQ	95 ON	M10X1.0	12
SEAT	LEON Mk1	1.9		AGR,AHF,ALH,ARL,ASV	00 TO 05	M10X1.0	12
SEAT	TERRA	1.3			90 TO 91	M12X1.25	1
SEAT	TERRA	1.4			90 ON	M12X1.25	1
SEAT	TOLEDO Mk1	1.9		1Y, AAZ	92 ON	M12X1.25	1
SEAT	LEON Mk1	1.9		1Z, AFN, AGR, AHF, AHU, ALH	95 ON	M10X1.0	12
SEAT	TOLEDO Mk2	1.9		AGR,ALH,ARL,AHF,ASV	99 ON	M10X1.0	12
SEAT	TOLEDO Mk2	1.9		ASZ	99 ON	M10X1.0	13
SKODA	FABIA	1.4		AMF, BNV	03 ON	M10X1.0	13
SKODA	TOLEDO Mk2	1.9	SDi	ASY	00 ON	M10X1.0	12
SKODA	TOLEDO Mk2	1.9	TDi UP TO 6Y-2-451087	ATD	00 ON	M10X1.0	12
SKODA	TOLEDO Mk2	1.9	TDi FROM 6Y-2-451088	ATD, AWX, BLT, BSW	03 ON	M10X1.0	13
SKODA	TOLEDO Mk2	1.9	V RS 130bhp	ASZ	03 ON	M10X1.0	13
SKODA	FELICIA	1.9	D	Y, AEF	97 TO 01	M12X1.25	1
SKODA	TOLEDO Mk2	1.9	D	AEY	97 TO 01	M10X1.0	12
SKODA	OCTAVIA	1.9	TD / TDi	1Z, AFN, AGR, AHF	98 ON	M10X1.0	12
SKODA	OCTAVIA	1.9	TD / TDi	ALH, ASV, ATD	98 ON	M10X1.0	12
SKODA	OCTAVIA	1.9	SDi	AEY, AGP, AQM	99 ON	M10X1.0	12
SKODA	OCTAVIA	1.9	TDi PD 130bhp	ASZ	03 ON	M10X1.0	13
SKODA	PICK UP	1.9	INCL. CUBE VAN	AEF	96 ON	M12X1.25	1
SKODA	SUPERB	1.9		AVB, AVF, AWX	02 TO 06	M10X1.0	13
SKODA	SUPERB	2.5	V6 TDI	AYM, BDG	02 ON	M10X1.0	17
SMART	CITY-COUPE	0.8		OM 660 DE8LA	98 TO 04	M10X1.25	11
SMART	FORTWO	0.8		OM 660	08 ON	M10X1.25	11
SSANGYONG	KORANDO	2.9		MB-OM 602	96 ON	M12X1.25	1
SSANGYONG	KORANDO	2.9		OM 662	96 ON	M12X1.25	1
SSANGYONG	MUSSO	2.9		MB-OM 602	95 ON	M12X1.25	1
SSANGYONG	REXTON	2.9			03 ON	M12X1.25	1
SUZUKI	GRAND VITARA	2.0	86 BHP		98 TO 01	M10X1.25	6
SUZUKI	GRAND VITARA	2.0	HDi (PSA) ENGINE		01 ON	M10X1.0	18
SUZUKI	IGNIS	1.3	DDiS	Z13DT	03 ON	M8X1.0	21
SUZUKI	JIMNY	1.5		DV4	03 ON	M10X1.0	12
SUZUKI	LIANA	1.4		DV4 8HY	04 ON	M8X1.0	21
SUZUKI	SWIFT	1.3	DDiS	Z13DT	06 ON	M8X1.0	21
SUZUKI	SX4	1.9		D19AA	06 ON	M10X1.0	15
SUZUKI	VITARA	1.9	PANEL VAN	PSA	00 TO 03	M12X1.25	1
SUZUKI	VITARA	2.0	70 BHP	RFL-4	96 TO 98	M10X1.25	6
TALBOT	EXPRESS	1.9				M12X1.25	1
TALBOT	EXPRESS	2.5	DIESEL/TURBO DIESEL			M12X1.25	1
TALBOT	HORIZON	1.9				M12X1.25	1
TAXI	AUSTIN	2.25	FX4, FX4/R		83 ON	M12X1.25	1
TAXI	FAIRWAY	2.7		NISSAN TD27	89 ON	M10X1.25	6
TOYOTA	AVENSIS 1	2.0	TD	2C-TE	97 TO 00	M10X1.25	9
TOYOTA	AVENSIS 1	2.0	D-4D	1CD-FTV	99 TO 03	M10X1.25	10
TOYOTA	AVENSIS 2	2.0	D-4D	1CD-FTV	03 TO 05	M10X1.25	10
TOYOTA	AVENSIS VERSO	2.0	D-4D	1CD-FTV	01 ON	M10X1.25	10
TOYOTA	CAMRY	2.0		2C-T	84 TO 88	M10X1.25	4
TOYOTA	CAMRY	2.0		1C-T	84 TO 88	M10X1.25	4
TOYOTA	CARINA II	2.0		2C	91 TO 92	M10X1.25	4
TOYOTA	CARINA E	2.0		2C	92 TO 96	M10X1.25	4
TOYOTA	CARINA E	2.0	TD	2C-T	96 TO 97	M10X1.25	9
TOYOTA	COROLLA	1.8		1C		M10X1.25	4
TOYOTA	COROLLA	2.0	D	2C-E	91 TO 00	M10X1.25	9
TOYOTA	COROLLA	2.0	D-4D	1CD-FTV	00 ON	M10X1.25	10
TOYOTA	COROLLA VERSO	2.0	D-4D	1CD-FTV	01 ON	M10X1.25	10
TOYOTA	HI-ACE	2.2		L	TO 91	M10X1.25	6
TOYOTA	HI-ACE	2.4		2L	TO 89	M10X1.25	6
TOYOTA	HI-ACE	2.4		2L	TO 89	M10X1.25	6
TOYOTA	HI-ACE	2.4		2L	91 ON	M10X1.25	7
TOYOTA	HI-ACE	2.5	D-4D	2KDFTV	01 ON	M10X1.25	10
TOYOTA	HI-LUX	2.2		L	TO 91	M10X1.25	6
TOYOTA	HI-LUX	2.4		2L	TO 03	M10X1.25	6

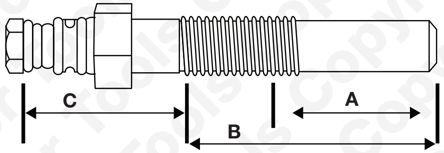
Instructions

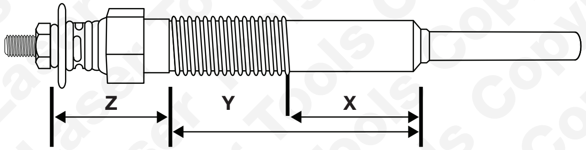
The following applications list has been compiled for reference only and The Tool Connection strongly advise the user to compare the listed adaptor to the glow plug fitted before attempting to connect to the vehicle.

Special attention should be paid to ensure the thread size and pitch of the adaptor matches that of the glow plug used.

Where the vehicle is not listed please follow the instructions below to identify if an appropriate adaptor is included in the kit.

1. Check the thread diameter and pitch - compare to thread sizing of adaptors
2. Measure from lowest thread of the glow plug to the sealing face of the glow plug - compare as shown.
3. Measure the length of the glow plug from the top of the threads to the sealing face - compare as shown.
4. Measure the length of the glow plug from the top of the threads to just below the top fixing -compare as shown.





A should be equal to or greater than X

B should be equal to or greater than Y

C should be equal to or greater than Z

Adaptor thread sizing

M12 x 1.25mm = 1, 2 and 3

M10 x 1.25mm = 4, 5, 6, 7, 8, 9, 10 and 11

M10 x 1.0mm = 12, 13, 15, 16, 17, 18, 19 and 20

M8 x 1.0mm = 21

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Precautions

- Always disconnect the fuel pump solenoid before cold cranking the engine
- Do not allow the engine to fire whilst connected to the tester
- Always conduct the test when the engine is cold
- Make sure the battery is fully charged when making the test to avoid incorrect readings. Replace appropriate glow plug or injector with dummy or adaptor.

Possible problems

Worn piston rings
If the engine is healthy and the battery fully charged, the compression should build up quickly. Low compression on the first stroke followed by gradual increased pressure indicates worn piston rings

Damaged Head or Head gasket
Low compression on first stroke which does not improve on further strokes indicates a leaking valve or a damaged head or gasket. A low reading from two adjacent cylinders indicates a damaged head gasket Coolant in the engine oil will also confirm this.

Cylinder Head carbonized
The compression will read unusually high. The cylinder head should be decarbonized.

Applications

RENAULT	KANGOO	1.5		K9K 700, K9K 704	02 ON	M10X1.0	12
RENAULT	KANGOO	1.9	D 55, D 65	F8Q 662, F8Q 630	98 ON	M10X1.0	13
RENAULT	KANGOO	1.9		F8Q 632	99 ON	M10X1.0	12
RENAULT	KANGOO	1.9	Dti	F9Q 780	00 ON	M10X1.0	12
RENAULT	KANGOO	1.9	DCI		00 ON	M10X1.0	12
RENAULT	LAGUNA 1	1.9	DTI	F9Q	98 TO 00	M10X1.0	12
RENAULT	ESPACE 2 / GRAND ESPACE	2.2	Incl. TURBO	G8T	905 TO 00	M10X1.0	12
RENAULT	LAGUNA 2	1.9	dCi	F9Q 710, 717, 718	01 ON	M10X1.0	12
RENAULT	LAGUNA 2	1.9	dCi	F9Q C750	01 ON	M10X1.0	12
RENAULT	LAGUNA 2	2.2	dCi	G9T 710	02 ON	M10X1.0	20
RENAULT	MASTER	1.9	dCi, dTi	F9QT-770	01 ON	M10X1.0	12
RENAULT	MASTER	2.2	dCi	F9Q	00 ON	M10X1.0	20
RENAULT	MASTER	2.4		S8U	82 TO 96	M12X1.25	1
RENAULT	MASTER	2.5	D	S8V-748	TO 97	M12X1.25	1
RENAULT	MASTER	2.5	D	S8V-770/772	98 ON	M12X1.25	1
RENAULT	MASTER	2.5	dCi	16S	00 ON	M10X1.0	20
RENAULT	MASTER	2.8	dTi	S9W-700/702	97 ON	M10X1.0	15
RENAULT	MEGANE 1	1.9	TURBO	F8Q-784/786 (12V)	96 ON	M12X1.25	2
RENAULT	MEGANE 1	1.9	NON TURBO	F8Q 620, F8Q 624	96 ON	M12X1.25	1
RENAULT	MEGANE 1	1.9	dTi	F9Q 730	98 ON	M10X1.0	12
RENAULT	MEGANE 1 PHASE 2	1.9	NON TURBO	F8Q 622, 790	99 TO 00	M10X1.0	12
RENAULT	MASTER	1.9	dCi	F9Q 731, 732, 736, 740, 808	00 ON	M10X1.0	12
RENAULT	MASTER	1.9	dTi	F9Q 730, 734	99 ON	M10X1.0	12
RENAULT	MASTER	1.9	dTi	F9QT-770	01 ON	M10X1.0	12
RENAULT	MEGANE 2	1.5	dCi	K9K…	02 ON	M10X1.0	12
RENAULT	MEGANE 2	1.9	dCi	F9Q…	02 ON	M10X1.0	12
RENAULT	MEGANE SCENIC	1.9	DT	F8Q 784, F8Q 786	97 TO 99	M12X1.25	2
RENAULT	MEGANE SCENIC	1.9	dTi	F9Q 730, F9Q 734	97 TO 99	M10X1.0	12
RENAULT	MODUS	1.5	dCi 65 / 80	K9K…	04 ON	M10X1.0	12
RENAULT	SAFRANE	2.5	TD		93 TO 96	M12X1.25	1
RENAULT	SCENIC (99 -03)	1.9	dTi	F9Q 730, 734	99 ON	M10X1.0	12
RENAULT	MODUS	1.9	dCi	F9Q 718, 731, 732, 736	00 ON	M10X1.0	12
RENAULT	MODUS	1.9	dTi	F9QT-770	01 ON	M10X1.0	12
RENAULT	SCENIC 2	1.5	dCi	K9K…	03 ON	M10X1.0	12
RENAULT	SCENIC 2	1.9	dCi	F9Q800, 808	03 ON	M10X1.0	12
RENAULT	TRAFIC	1.9		F8Q 600, F8Q 606	97 TO 00	M10X1.0	13
RENAULT	SCENIC 2	1.9	dCi	F9Q 760/770	01 ON	M10X1.0	12
RENAULT	SCENIC 2	2.1			81 TO 94	M12X1.25	1
RENAULT	SCENIC 2	2.1		JS 620, JS 758	94 TO 98	M12X1.25	1
RENAULT	SCENIC 2	2.5		SOFIM	90 TO 97	M12X1.25	1
RENAULT	SCENIC 2	2.5		S8U-758/780/782	97 ON	M12X1.25	1
RENAULT	VEL SATIS	2.2	dCi		03 ON	M10X1.0	20
ROVER	25	2.0	8 VALVE		99 ON	M10X1.0	12
ROVER	45	2.0	8 VALVE		99 ON	M10X1.0	12
ROVER	75	2.0	16 VALVE CDT	M47R (BMW)	99 ON	M10X1.0	12
ROVER	115	1.5	12 V	TUD 5	95 TO 98	M10X1.0	12
ROVER	218	1.8	Inc TURBO		91 TO 96	M12X1.25	1
ROVER	218	1.9	Inc TURBO		91 TO 96	M12X1.25	1
ROVER	418	1.8	Inc TURBO		91 TO 96	M12X1.25	1
ROVER	418	1.9	Inc TURBO		91 TO 96	M12X1.25	1
ROVER	825	2.5	UP TO VIN V230966	VM	91 TO 96	M12X1.25	1
ROVER	825	2.5	FROM VIN V230967	VM	96 TO 99	M10X1.0	13
ROVER	220	2.0		20T2R, 20T2N (Intercooled)	95 TO 99	M10X1.0	12
ROVER	420	2.0		20T2R, 20T2N (Intercooled)	95 TO 99	M10X1.0	12
ROVER	620	2.0		20T2R, 20T2N (Intercooled)	95 TO 99	M10X1.0	12
ROVER	2400	2.4	SDi		82 TO 86	M12X1.25	1
ROVER	MAESTRO	2.0	Incl. TURBO	PERKINS PRIMA	90 ON	M12X1.25	1
ROVER	METRO	1.4			92 TO 95	M12X1.25	1
ROVER	MONTEGO	2.0	Incl. TURBO		88 ON	M12X1.25	1
ROVER	STREETWISE	2.0	8 VALVE		03 ON	M10X1.0	12
SAAB	9-3 Mk1	2.2	TiD	X22DTH	98 TO 00	M10X1.0	16
SAAB	9-3 Mk3	1.9		8V Z19DT	04 ON	M10X1.0	15
SAAB	9-3 Mk5	2.2	125BHP, 175BHP	D223L	02 ON	M10X1.25	9
SAAB	9-6	2.2	TiD	D223L	02 ON	M10X1.0	16
SEAT	ALHAMBRA 1	1.9		1Z, AHU, AFN,ANU	96 ON	M10X1.0	12
SEAT	ALHAMBRA 2	1.9		AUY	00 ON	M10X1.0	12
SEAT	ALHAMBRA 2	1.9		ASZ	02 ON	M10X1.0	13
SEAT	AROSA	1.4		AMF	02 ON	M10X1.0	13
SEAT	ALHAMBRA 2	1.7	SDi	AKU	98 ON	M10X1.0	12
SEAT	CORDOBA	1.9	Incl. TURBO	1Y, AAZ	94 TO 96	M12X1.25	1
SEAT	ALHAMBRA 2	1.9	Tdi (Intercooler)	AFN	97 TO 99	M10X1.0	12
SEAT	ALHAMBRA 2	1.9	SDi	AGP, AQM	99 TO 02	M10X1.0	12
SEAT	ALHAMBRA 2	1.9	TDi	AGR,ALH,ALK,ASK,ASV	99 TO02	M10X1.0	12
SEAT	ALHAMBRA 2	1.9	TDi	ATD, AXR, BLT	03 TO 06	M10X1.0	13

Applications

PEUGEOT	406	2.0	HDi	DW10TD, DW10TED	99 ON	M10X1.0	18
PEUGEOT	406	2.1	TURBO	XUD11 ATE	96 TO 98	M12X1.25	1
PEUGEOT	406	2.1		XUD11 BTE	98 TO 99	M12X1.25	1
PEUGEOT	406	2.2	HDi	DW12TED	00 TO 03	M10X1.0	18
PEUGEOT	407	1.6		DV6TED	04 TO 06	M8X1.0	21
PEUGEOT	504	2.3	PICK UP	XD2	84 ON	M12X1.25	1
PEUGEOT	505	2.5	TURBO/NON TURBO		82 ON	M12X1.25	1
PEUGEOT	604	2.5	TURBO/NON TURBO	152A XD3T	82 ON	M12X1.25	1
PEUGEOT	605	2.1	TURBO/NON TURBO	XUD11 ATE/L,BTE	90 TO 98	M12X1.25	1
PEUGEOT	605	2.1		XUD11 BTE	98 ON	M12X1.25	1
PEUGEOT	607	2.0	HDi 110	DW10TD	01 TO 05	M10X1.0	18
PEUGEOT	607	2.2		DW12TED	01 TO 05	M10X1.0	18
PEUGEOT	806	1.9	TURBO	XUD9TE	95 TO 98	M12X1.25	1
PEUGEOT	806	1.9		XUD9TE	98 ON	M12X1.25	1
PEUGEOT	806	2.0	HDi	DW10TED	99 ON	M10X1.0	18
PEUGEOT	807	2.0	HDi	DW10TED	02 ON	M10X1.0	18
PEUGEOT	807	2.2	HDi	DW12TED4	02 ON	M10X1.0	18
PEUGEOT	BOXER	1.9	NON TURBO	XUD9AU	94 TO 98	M12X1.25	1
PEUGEOT	BOXER	1.9	TURBO	XUD9TFU	94 TO 98	M12X1.25	1
PEUGEOT	BOXER	1.9		XUD9AU, XUD9TFU	98 ON	M12X1.25	1
PEUGEOT	BOXER	2.0	HDi	DW10TED, DW10DU	99 ON	M10X1.0	18
PEUGEOT	BOXER	2.2	HDi & HDi TD	DW12TED4	01 ON	M10X1.0	18
PEUGEOT	BOXER	2.5	NON TURBO	DJ5	94 ON	M12X1.25	1
PEUGEOT	BOXER	2.5	TDI	DJ5TED 12V	96 ON	M10X1.0	13
PEUGEOT	BOXER	2.5	TURBO	DJ5T	94 TO 96	M12X1.25	1
PEUGEOT	BOXER	2.8	HDi TD		00 ON	M10X1.0	15
PEUGEOT	EXPERT	1.9		XUD9A	96 TO 98	M12X1.25	1
PEUGEOT	EXPERT	1.9	TURBO	XUD 9TE	96 TO 98	M12X1.25	1
PEUGEOT	EXPERT	1.9		DW8	98 ON	M10X1.0	12
PEUGEOT	EXPERT	1.9		XUD 9A, XUD 9TF, XUD 9BTF	98 ON	M12X1.25	1
PEUGEOT	EXPERT	2.0	HDi	DW10	00 ON	M10X1.0	18
PEUGEOT	J5				82 ON	M12X1.25	1
PEUGEOT	J7				82 ON	M12X1.25	1
PEUGEOT	J9				82 ON	M12X1.25	1
PEUGEOT	PARTNER	1.8		XUD7	96 TO 98	M12X1.25	1
PEUGEOT	PARTNER	1.8		XUD7	98 ON	M12X1.25	1
PEUGEOT	PARTNER	1.9		DW8	98 ON	M10X1.0	12
PEUGEOT	PARTNER	1.9		XUD9A	96 TO 98	M12X1.25	1
PEUGEOT	PARTNER	1.9		XUD9A	98 ON	M12X1.25	1
PEUGEOT	PARTNER	2.0	HDi	DW10	00 ON	M10X1.0	18
PROTON	PERSONA	2.0	SDi		96 TO 97	M10X1.25	6
PROTON	PERSONA	2.0	TDi		97 TO 99	M10X1.25	6
PROTON	WIRA	2.0	TD		00 TO 04	M10X1.25	6
RENAULT	5	1.6			87 TO 92	M12X1.25	2
RENAULT	9	1.6			83 TO 89	M12X1.25	2
RENAULT	11	1.6			84 TO 89	M12X1.25	2
RENAULT	18	2.1			81 TO 86	M12X1.25	1
RENAULT	19	1.9	NON TURBO	F8Q	89 TO 91	M12X1.25	1
RENAULT	19	1.9	NON TURBO	F8Q	91 ON	M12X1.25	2
RENAULT	19	1.9	TURBO	F8Q TURBO	90 TO 96	M12X1.25	2
RENAULT	21	1.9	NON TURBO		89 TO 91	M12X1.25	1
RENAULT	21	1.9	NON TURBO	F8Q	91 ON	M12X1.25	2
RENAULT	21	2.1	NON TURBO		86 TO 95	M12X1.25	1
RENAULT	21	2.1	TURBO		86 ON	M12X1.25	1
RENAULT	25	2.1			84 TO 93	M12X1.25	1
RENAULT	AVANTIME	2.2	dCi		02 ON	M10X1.0	20
RENAULT	CLIO 1	1.9			90 TO 91	M12X1.25	1
RENAULT	CLIO 1	1.9		F8Q	91 TO 98	M12X1.25	2
RENAULT	CLIO 2	1.9		F8Q 630	98 ON	M10X1.0	13
RENAULT	CLIO 2	1.9		F8Q 632	99 ON	M10X1.0	12
RENAULT	CLIO 2 Phase 2	1.5		K9K 704	01 ON	M10X1.0	12
RENAULT	CLIO 3	1.5		K9K 764, 766, 768	05 ON	M10X1.0	12
RENAULT	ESPACE 1	2.1	TURBO	J8S	93 TO 97	M12X1.25	1
RENAULT	ESPACE 2 / GRAND ESPACE	2.2	TURBO	G8T 714/716	97 TO 00	M10X1.0	12
RENAULT	ESPACE 3 / GRAND ESPACE	2.2	dCi	G9T 710	00 ON	M10X1.0	20
RENAULT	ESPACE 4 / GRAND ESPACE	1.9	dCi	F9Q	02 ON	M10X1.0	12
RENAULT	ESPACE 4 / GRAND ESPACE	2.2	dCi	G9T 742/743	02 ON	M10X1.0	20
RENAULT	EXPRESS / EXTRA	1.6			86 ON	M12X1.25	2
RENAULT	EXPRESS / EXTRA	1.9			86 TO 91	M12X1.25	2
RENAULT	EXPRESS / EXTRA	1.9		F8Q 774, 776, 730	91 ON	M12X1.25	2
RENAULT	EXPRESS / EXTRA	1.9		F8Q 640, 644, 646, 648	94 ON	M12X1.25	1
RENAULT	EXPRESS / EXTRA	1.9	D 55, D 65	F8Q 662, F8Q 630	98 ON	M10X1.0	13
RENAULT	GRAND SCENIC	1.5		K9K	04 ON	M10X1.0	12
RENAULT	GRAND SCENIC	1.9		F9Q	04 ON	M10X1.0	12

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Applications

MANUFACTURER	MODEL	SIZE	TYPE	ENG TYPE/CODE	DATE	PLUG SIZE	ADAPTOR
ALFA	147	1.9		8V JTD	03 ON	M10X1.0	15
ALFA	156	1.9		8V JTD	03 ON	M10X1.0	15
ALFA	156	1.9		16V JTD	03 TO 05	M10X1.0	15
ALFA	156	2.4		AR.32501	99 TO 00	M10X1.0	15
ALFA	156	2.4		839 A6.000	00 TO 03	M10X1.0	15
ALFA	156	2.4	150bhp	841 C.000	02 ON	M10X1.0	15
ALFA	MITO	1.3	JTDM	199A3.000	08 ON	M8X1.0	21
AUDI	80	1.6	TD	SB	86 TO 97	M12X1.25	1
AUDI	80	1.9	TD	AAZ	92 ON	M12X1.25	1
AUDI	80	1.9	TDi	1Z	92 ON	M10X1.0	12
AUDI	100	2.0	D.TD	NC	82 TO 91	M12X1.25	1
AUDI	100	2.5	TDi	1T	90 TO 91	M10X1.0	12
AUDI	A2	1.4		AMF, ANY, BHC	00 ON	M10X1.0	13
AUDI	A3	1.4		BAY	03N ON	M10X1.0	12
AUDI	A3	1.9		AGR,AHF,AJM,ALH,ANU,ASV	96 ON	M10X1.0	12
AUDI	A3	1.9		ASZ, ATD, AXR	00 TO 03	M10X1.0	12
AUDI	A3	1.9		ASZ, ATD, AXR	00 TO 03	M10X1.0	13
AUDI	A4	1.9		1Z,AFF,AFN,AHH	95 TO 04	M10X1.0	12
AUDI	A4	1.9		AHU,AJM,ATJ	95 TO 04	M10X1.0	12
AUDI	A4	1.9		AVB, AVF, AWX	01 TO 04	M10X1.0	12
AUDI	A4	1.9		AVB, AVF, AWX	01 TO 04	M10X1.0	13
AUDI	A4	2.5	V6 TDI	AFB,AKE,AKN,AYM	98 ON	M10X1.0	17
AUDI	A4	2.5	V6 TDI	BAU,BCZ,BDG,BDH,BFC	02 ON	M10X1.0	17
AUDI	A4	2.5	V6 TDI	BCZ, BDG	04 ON	M10X1.0	17
AUDI	A6	1.9		1Z,AFF,AFN,AHU,AVF,AVG	95 ON	M10X1.0	12
AUDI	A6	1.9		AJM,AVB,AWX	00 ON	M10X1.0	13
AUDI	A6	2.5		AAT, AEL	94 TO 97	M10X1.0	12
AUDI	A6	2.5	V6 TDI	AFB,AKE,AKN,AYM	97 ON	M10X1.0	17
AUDI	A6	2.5	V6 TDI	BAU,BCZ,BDG,BDH,BFC	02 ON	M10X1.0	17
AUDI	A8	4.0	V6 TDI	ASE	03 ON	M10X1.0	17
AUDI	ALL ROAD	2.5	V6 TDI	AFB,AKE,AKN,AYM,BAU,BCZ,BDG,BDH,BFC	04 TO 06	M10X1.0	17
BEDFORD	CF	2.3			84 TO 87	M12X1.25	1
BMW	118 E87	2.0		M47 N20 4D4 (122BHP)	04 ON	M10X1.25	4
BMW	120 E87	2.0		M47 N20 4D4 (163BHP)	04 ON	M10X1.25	4
BMW	318 E36	1.7	Tds	M41	95 ON	M12X1.25	1
BMW	318 E46	2.0		M47 N20 4D4 Euro 4	04 ON	M10X1.25	4
BMW	318 E90 / E91	2.0		M47 N20 4D4 Euro 4	05 ON	M10X1.25	4
BMW	320 E46	2.0		M47 D20 4D1	99 TO 01	M10X1.0	12
BMW	321 E46	2.0		M47 N20 4D4 Euro 4	01 ON	M10X1.25	4
BMW	320 E90 / E91	2.0		M47 N20 4D4 Euro 4	05 ON	M10X1.25	4
BMW	325 E36	2.5	Tds	M51 D25	93 ON	M12X1.25	1
BMW	325 E90 / E91	3.0		M57 N2 D30	06 ON	M10X1.25	4
BMW	330 E46	2.9		M57 D30 (2926cc)	99 ON	M10X1.0	12
BMW	331 E46	3.0		M57 N30 6D2 (2998cc)	03 ON	M10X1.25	4
BMW	330 E90 / E91	3.0		M57 N2 D30 (231bhp)	06 ON	M10X1.25	4
BMW	335 E90 / E91	3.0	TWIN TURBO	M57 N2 D30 (286bhp)	06 ON	M10X1.25	4
BMW	520 E60 / 61	2.0		M47 N204D4	05 TO 07	M10X1.25	4
BMW	525 E34	2.5	TD	M51 D25 (115bhp)	93 TO 96	M12X1.25	1
BMW	526 E34	2.5	td tds	M51 D25 (143bhp)	93 TO 97	M12X1.25	1
BMW	525 E39	2.5		M51 D25	97 TO 98	M12X1.25	1
BMW	526 E39	2.5		M57 D25 (163bhp)	00 ON	M10X1.0	12
BMW	525 E60 / E61	2.5		M57 N25 6D4 (177bhp)	04 ON	M10X1.25	4
BMW	530 E39	2.9		M57 D30 (184bhp)	98 ON	M10X1.0	12
BMW	530 E60 / E61	3.0		M57 N30 6D2	03 ON	M10X1.25	4
BMW	535 E60 / E61	3.0		M57 N30 6D4	04 ON	M10X1.25	4
BMW	730 E38	3.0		M57 D30	98 TO 01	M10X1.0	12
BMW	730 E65	3.0		M57 N30 6D2	03 ON	M10X1.25	4
BMW	X3 E83	2.0		M47 N20 4D4	04 ON	M10X1.25	4
BMW	X3 E83	3.0		M57 N30 6D4	05 ON	M10X1.25	4
BMW	X5 E53	3.0		M57 30 6D1	01 TO 02	M10X1.0	12
BMW	X5 E53	3.0		M57 N30 6D4	03 TO 06	M10X1.25	4
BMW	X5 E70	3.0		M57 N2 D30	07 ON	M10X1.25	4
CHRYSLER	GRAND VOYAGER	2.5		VM	98 TO 01	M10X1.0	13
CHRYSLER	VOYAGER	2.5	TD 115 BHP	VMKHR492/VM425	92 TO 95	M12X1.25	1
CHRYSLER	VOYAGER	2.5	TD LE 129 BHP	HR 425 CLI	92 TO 95	M12X1.25	1
CHRYSLER	VOYAGER	2.5		VM	95 TO 01	M10X1.0	13
CHRYSLER	PT CRUISER	2.2	CRD 2148cc	EDJ	02 ON	M10X1.0	19
CITROEN	AX	1.4		TUD 3L	89 TO 94	M12X1.25	1
CITROEN	AX	1.5		TUD 5	94 ON	M10X1.0	12
CITROEN	BERLINGO	1.8		A9A/XUD7	96 TO 98	M12X1.25	1
CITROEN	BERLINGO	1.8		XUD7	98 ON	M12X1.25	1
CITROEN	BERLINGO	1.9		DW8	98 ON	M10X1.0	12

CITROEN	BERLINGO	1.9		DJY/XUD9A	96 TO 98	M12X1.25	1
CITROEN	BERLINGO	1.9		XUD9A	98 ON	M12X1.25	1
CITROEN	BERLINGO	2.0	HDi	DW10	01 ON	M10X1.0	18
CITROEN	BX	1.8		XUD7	85 ON	M12X1.25	1
CITROEN	BX	1.9		XUD9	84 ON	M12X1.25	1
CITROEN	C2	1.4	Hdi	DV4TD	03 TO 04	M8X1.0	21
CITROEN	C3	1.4	Hdi	DV4TD	02 ON	M8X1.0	21
CITROEN	C4	1.6	HDi 90	DV6TED4	04 ON	M8X1.0	21
CITROEN	C4	1.6	HDi 110	DV6TED4	04 ON	M8X1.0	21
CITROEN	C4	2.0		DW10BTED4	04 ON	M10X1.0	18
CITROEN	C5	2.0	HDi 90/110	RHY (DW10TD), RHZ (DW10ATED)	01 TO 04	M10X1.0	18
CITROEN	C5	2.2	HDI 136	4HX (DW12TED4/FAP)	01 TO 04	M10X1.0	18
CITROEN	C8	2.0	HDi 110	DW10ATED4	02 TO 06	M10X1.0	18
CITROEN	C8	2.2		DW12TED	02 TO 03	M10X1.0	18
CITROEN	C15 VAN	1.8		XUD7	86 TO 98	M12X1.25	1
CITROEN	C15 VAN	1.8		XUD7	98 TO 01	M12X1.25	1
CITROEN	C15 VAN	1.9		DW8B	01 ON	M10X1.0	12
CITROEN	C25 VAN	1.9		D9B	87 ON	M12X1.25	1
CITROEN	C25 VAN	2.5		CRD93	87 ON	M12X1.25	1
CITROEN	CX	2.5			83 TO 91	M12X1.25	1
CITROEN	DISPATCH	1.9		XUD9A, XUD9TF	96 TO 98	M12X1.25	1
CITROEN	DISPATCH	1.9		XUD9A, XUD9TF	98 ON	M12X1.25	1
CITROEN	DISPATCH	1.9		DW8	98 ON	M10X1.0	12
CITROEN	DISPATCH	2.0	HDi	DW10	00 ON	M10X1.0	18
CITROEN	DISPATCH	2.0	HDi 16 V	DW10ATED	02 ON	M10X1.0	18
CITROEN	EVASION	1.9	TURBO	XUD9TF	94 TO 98	M12X1.25	1
CITROEN	EVASION	2.1	TURBO		96 TO 98	M12X1.25	1
CITROEN	RELAY	1.9		XUD9TF, 9AU	94 TO 98	M12X1.25	1
CITROEN	RELAY	1.9		XUD9TF	98 ON	M12X1.25	1
CITROEN	RELAY	2.0	HDi	DW10TED/DU	98 ON	M10X1.0	18
CITROEN	RELAY	2.2	Hdi	DW12TED	02 ON	M10X1.0	18
CITROEN	RELAY	2.5		DJ5, DJ5T	94 ON	M12X1.25	1
CITROEN	RELAY	2.5	TDI	DJ5TED 12V	96 ON	M10X1.0	13
CITROEN	RELAY	2.8	Hdi	8140.63	01 TO 02	M10X1.0	15
CITROEN	SAXO 1	1.5		VJZ (TUD 5/L3)	96 ON	M10X1.0	12
CITROEN	SAXO 2	1.5		TUD 5	99 ON	M10X1.0	12
CITROEN	SYNERGIE	1.9	TD	XUD9BTF/L3	95 TO 98	M12X1.25	1
CITROEN	SYNERGIE	1.9		XUD9TF, XUD9BTF	98 TO 00	M12X1.25	1
CITROEN	SYNERGIE	2.0	HDI	DW10TED	99 ON	M10X1.0	18
CITROEN	VISA 17 D	1.8		161A	85 TO 88	M12X1.25	1
CITROEN	XANTIA	1.9		DHW (XUD9SD/L3)	93 ON	M12X1.25	1
CITROEN	XANTIA	1.9		DHX (XUD9BTF/L3)	93 TO 98	M12X1.25	1
CITROEN	XANTIA	1.9		XUD9A, XUD9BTF, XUD9BSD	98 ON	M12X1.25	1
CITROEN	XANTIA	2.0	HDI	DW10TD, DW10TED	98 ON	M10X1.0	18
CITROEN	XANTIA	2.1	TURBO DIESEL	PBC (XUD11BTE/L3)	97 TO 98	M12X1.25	1
CITROEN	XANTIA	2.1	TURBO DIESEL	PBC (XUD11BTE/L3)	98 TO 00	M12X1.25	1
CITROEN	XM	2.1	TURBO	XUD11 ATE/L,BTE	90 TO 98	M12X1.25	1
CITROEN	XM	2.1	TURBO	XUD11BTE	98 ON	M12X1.25	1
CITROEN	XM	2.5	TURBO	THY (DK5 ATE/L3)	94 ON	M12X1.25	1
CITROEN	XSARA 1	1.9	NON TURBO	DJY (XUD9A/L/3)	97 TO 00	M12X1.25	1
CITROEN	XSARA 1	1.9	TURBO 90	DHX (XUD9TE)	97 TO 00	M12X1.25	1
CITROEN	XSARA 1	2.0	HDI	DW10	99 ON	M10X1.0	18
CITROEN	XSARA 2	1.4	Hdi	8HZ	02 TO 04	M8X1.0	21
CITROEN	XSARA 2	1.9	PLUG Ø 10mm	DW8	00 ON	M10X1.0	12
CITROEN	XSARA 2	2.0	HDI 90	DW10TED	00 ON	M10X1.0	18
CITROEN	XSARA 2	2.0	HDI 110	DW10ATED	01 ON	M10X1.0	18
CITROEN	XSARA PICASSO	1.6	Hdi	DV6TED4	04 ON	M8X1.0	21
CITROEN	XSARA PICASSO	2.0	HDI	DW10	00 ON	M10X1.0	18
CITROEN	ZX	1.9	(NON TURBO)	XUD9AL	92 ON	M12X1.25	1
CITROEN	ZX	1.9	TURBO	XUD9TL	93 ON	M12X1.25	1
DACIA	DUSTER	1.6	RENAULT ENGINE		92 TO 99	M12X1.25	1
DAEWOO	KORANDO	2.9			00 ON	M12X1.25	1
DAEWOO	MUSSO	2.9			00 ON	M12X1.25	1
DAIHATSU	CHARADE	1.0		CL 10	83 TO 87	M10X1.25	4
DAIHATSU	CHARADE	1.0		CL 10	87 ON	M10X1.25	4
DAIHATSU	FOURTRAK	2.8		DL40	TO 84	M10X1.25	4
DAIHATSU	FOURTRAK	2.8	NON TURBO	DL50	84 TO 93	M10X1.25	4
DAIHATSU	FOURTRAK	2.8	TURBO	DL51	89 TO 93	M10X1.25	4
DAIHATSU	FOURTRAK	2.8	TURBO INTERCOOLER	DL52	93 ON	M10X1.25	4
FIAT	500	1.3	JTD	169.A1.000	09 ON	M8X1.0	21
FIAT	BRANDO	1.9	TD	169.A0.000	92 TO 96	M12X1.25	1
FIAT	BRAVA	1.9	TD		96 TO 01	M12X1.25	1
FIAT	BRAVA	1.9	JTD	Eng No. UP TO 1716459	98 TO 00	M10X1.0	15
FIAT	BRAVA	1.9	JTD	Eng. No. FROM 1716450	99 ON	M10X1.0	15

NISSAN	INTERSTAR	2.5	dCi 115 PS		02 ON	M10X1.0	20
NISSAN	KUBISTAR	1.5	60,70,80 PS		03 ON	M10X1.0	12
NISSAN	MICRA K12	1.5	dCi	K9K	02 ON	M10X1.0	12
NISSAN	NAVARA	2.5	131bhp DI TURBO	TD25TI	02 ON	M10X1.25	6
NISSAN	NOTE	1.5		K9K	06 ON	M10X1.0	12
NISSAN	PATROL	3.3		SD33	82 TO 86	M10X1.25	5
NISSAN	PATROL	3.3		SD33T	85 TO 87	M10X1.25	5
NISSAN	PATROL	3.3		SD33	87 ON	M10X1.25	5
NISSAN	PATROL	3.3		SD33T	87 ON	M10X1.25	5
NISSAN	PATROL	3.3		SD33	80 TO 82	M10X1.25	7
NISSAN	PATROL	3.3		SD33	82 TO 86	M10X1.25	5
NISSAN	PATROL	3.3		SD33T	85 TO 87	M10X1.25	5
NISSAN	PATROL	4.2		TD42		M10X1.25	6
NISSAN	PICK UP D21	2.5		SD25	87 TO 98	M10X1.25	5
NISSAN	PICK UP D21	2.5	TURBO	TD25	87 TO 98	M10X1.25	6
NISSAN	PICK UP D21	2.7	TURBO	TD27	87 TO 98	M10X1.25	6
NISSAN	PICK UP D22	2.5	82bhp	TD25	98 TO 02	M10X1.25	6
NISSAN	PICK UP D22	2.5	102bhp DI TURBO	TD25TI	98 TO 02	M10X1.25	6
NISSAN	PICK UP D22	2.5	131bhp DI TURBO	TD25TI	02 ON	M10X1.25	6
NISSAN	PRIMASTAR	1.9	dCi 82 & 100 PS	F9Q	02 ON	M10X1.0	12
NISSAN	PRIMERA 1 P10	2.0		CD20	92 TO 96	M10X1.25	7
NISSAN	PRIMERA 2 P11	2.0	TD	CD20T	96 TO 02	M10X1.25	7
NISSAN	PRIMERA 3 P12	2.2	DI	YD22ET	02 ON	M10X1.0	20
NISSAN	SERENA	2.0		LD20DHC	93 TO 96	M10X1.25	6
NISSAN	SERENA	2.3		LD23	95 TO 00	M10X1.25	6
NISSAN	SUNNY	1.7	B13	CD17	86 TO 91	M10X1.25	6
NISSAN	SUNNY	1.7	N14	CD17	91 ON	M10X1.25	6
NISSAN	SUNNY	2.0	N14	CD20	92 TO 96	M10X1.25	7
NISSAN	TERRANO II	2.7	TD	T27T	93 TO 96	M10X1.25	6
NISSAN	TERRANO II	2.7	TDi	TD27TI	96 ON	M10X1.25	6
NISSAN	TERRANO III	2.7	TD	TD27Ti	02 ON	M10X1.25	6
NISSAN	TERRANO VAN	2.7	TD	TD27Ti	02 ON	M10X1.25	6
NISSAN	URVAN	2.3		TD23		M10X1.25	6
NISSAN	URVAN	2.3		SD23	84 TO 88	M10X1.25	5
NISSAN	URVAN	2.3		SD23	84 TO 87	M10X1.25	5
NISSAN	URVAN	2.7		TD27		M10X1.25	6
NISSAN	VANETTE	2.0		LD20	81 TIO 82	M12X1.25	2
NISSAN	VANETTE	2.0		LD20	82 TO 87	M10X1.25	11
NISSAN	VANETTE	2.0		LD20	87 ON	M10X1.25	6
NISSAN	VANETTE	2.3	CARGO	LD23	95 TO 98	M10X1.25	6
NISSAN	VANETTE	2.3	E	LD23	98 ON	M10X1.25	6
NISSAN	X TRAIL	2.2	Di 112	YD22ET	01 ON	M10X1.0	20
OPEL	ASCONA	1.6			83 ON	M12X1.25	1
OPEL	KADETT	1.6			83 ON	M12X1.25	1
OPEL	REKORD	2.3	TURBO		83 ON	M12X1.25	1
OPEL	VECTRA	1.7			83 ON	M12X1.25	1
PEUGEOT	106	1.4		TUD 3	92 ON	M12X1.25	1
PEUGEOT	106	1.5		TUD 5	94 TO 02	M10X1.0	12
PEUGEOT	106	1.5		VJX TUD 5	00 ON	M10X1.0	12
PEUGEOT	1007	1.4			05 ON	M8X1.0	21
PEUGEOT	205	1.8		XUD7, XUD7T	83 TO 98	M12X1.25	1
PEUGEOT	205	1.9		XUD9	TO 98	M12X1.25	1
PEUGEOT	206	1.4		DV4TD	02 ON	M8X1.0	21
PEUGEOT	206	1.6		DV6TED	04 ON	M8X1.0	21
PEUGEOT	206	1.9	NON TURBO	DW8B	98 ON	M10X1.0	12
PEUGEOT	206	2.0	HDi	DW10	99 ON	M10X1.0	18
PEUGEOT	305	1.9			82 ON	M12X1.25	1
PEUGEOT	306	1.9	NON TURBO	DW8	98 ON	M10X1.0	12
PEUGEOT	306	1.9		XUD7	98 ON	M12X1.25	1
PEUGEOT	306	1.9	XND, XRD, XTD	XUD9A/L	93 TO 98	M12X1.25	1
PEUGEOT	306	1.9	XND, XRD, XTD	XUD9A, XUD9BSD	98 ON	M12X1.25	1
PEUGEOT	306	1.9	XRDT, XTDT	XUD9TE	93 TO 98	M12X1.25	1
PEUGEOT	306	1.9	XRDT, XTDT	XUD9TE	98 ON	M12X1.25	1
PEUGEOT	306	2.0	HDi	DW10TD	99 ON	M10X1.0	18
PEUGEOT	307	1.4		DV4TD	01 ON	M8X1.0	21
PEUGEOT	307	1.6		DV6TED	04 ON	M8X1.0	21
PEUGEOT	307	2.0	HDi 90 & 110	DW10TD	01 TO 04	M10X1.0	18
PEUGEOT	309	1.8	TURBO	XUD7T	89 TO 93	M12X1.25	1
PEUGEOT	309	1.9		XUD9	87 TO 93	M12X1.25	1
PEUGEOT	405	1.8	TURBO	XUD7TE		M12X1.25	1
PEUGEOT	405	1.9	NON TURBO	XUD9A	88 ON	M12X1.25	1
PEUGEOT	405	1.9	TURBO	XUD9TE, XUD9TF	92 ON	M12X1.25	1
PEUGEOT	406	1.9	TURBO	XUD9TE, XUD9TF	96 TO 98	M12X1.25	1
PEUGEOT	406	1.9	INCLUDING TURBO	XUD9SD, XUD9BSD, XUD9BTF	98 ON	M12X1.25	1

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Applications

MERCEDES-BENZ	E320 CDI	3.2	211 Series	OM 648.961	02 TO 04	M10X1.0	19
MERCEDES-BENZ	G300	3.0		OM 603.931	93 ON	M12X1.25	1
MERCEDES-BENZ	G WAGON	3.0			81 to 90	M12X1.25	1
MERCEDES-BENZ	G WAGON	3.0		OM 603.931	91 TO 93	M12X1.25	1
MERCEDES-BENZ	L407				81 to 89	M12X1.25	1
MERCEDES-BENZ	ML270	2.7			00 ON	M10X1.0	19
MERCEDES-BENZ	S320	3.2	220 Series	COM 648.960	99 ON	M10X1.0	19
MERCEDES-BENZ	SPRINTER 208 D	2.2		OM 611.987	95 ON	M10X1.0	19
MERCEDES-BENZ	SPRINTER 208 D	2.3		OM 601	95 ON	M12X1.25	1
MERCEDES-BENZ	SPRINTER 210 D	2.9		OM 602.980	97 TO 00	M12X1.25	2
MERCEDES-BENZ	SPRINTER 212 D	2.9		OM 602.980.12	95 ON	M12X1.25	1
MERCEDES-BENZ	SPRINTER 212 D	2.9		OM 602.980.12	96 ON	M12X1.25	2
MERCEDES-BENZ	SPRINTER 212 D	2.9		OM 602.980.10	95 ON	M12X1.25	1
MERCEDES-BENZ	SPRINTER 212 D	2.9		OM 602.980.10	95 ON	M12X1.25	2
MERCEDES-BENZ	SPRINTER 308 D	2.3		OM 601	95 ON	M12X1.25	1
MERCEDES-BENZ	SPRINTER 310 D	2.9		OM 602.980	97 TO 00	M12X1.25	2
MERCEDES-BENZ	SPRINTER 312 D	2.9		OM 602.980.12	95 ON	M12X1.25	1
MERCEDES-BENZ	SPRINTER 312 D	2.9		OM 602.980.12	95 ON	M12X1.25	2
MERCEDES-BENZ	SPRINTER 312 D	2.9		OM 602.980.10	95 ON	M12X1.25	1
MERCEDES-BENZ	SPRINTER 312 D	2.9		OM 602.980.10	96 ON	M12X1.25	2
MERCEDES-BENZ	SPRINTER 412 D	2.9		OM 602.980.12	95 ON	M12X1.25	1
MERCEDES-BENZ	SPRINTER 412 D	2.9		OM 602.980.12	95 ON	M12X1.25	2
MERCEDES-BENZ	SPRINTER 412 D	2.9		OM 602.980.10	95 ON	M12X1.25	1
MERCEDES-BENZ	SPRINTER 412 D	2.9		OM 602.980.10	95 ON	M12X1.25	2
MERCEDES-BENZ	SPRINTER CDI	2.2	208 / 308 / 408 / CDI		00 ON	M10X1.0	19
MERCEDES-BENZ	SPRINTER CDI	2.2	211 / 311 / 411 CDI		00 ON	M10X1.0	19
MERCEDES-BENZ	SPRINTER CDI	2.2	213 / 313 / 413 CDI		00 ON	M10X1.0	19
MERCEDES-BENZ	SPRINTER CDI	2.7	216 / 316 / 416 CDI		00 ON	M10X1.0	19
MERCEDES-BENZ	V220	2.2	CDi	OM 611.980	99 ON	M10X1.0	19
MERCEDES-BENZ	VANEO	1.7	CDi	OM 668	02 ON	M10X1.0	19
MERCEDES-BENZ	VIANO	2.2	CDi	OM 646.983	04 ON	M10X1.0	19
MERCEDES-BENZ	VITO 108 D	2.3		OM 601.942	96 TO 03	M12X1.25	1
MERCEDES-BENZ	VITO 108 CDI	2.2	CDi	OM 611 A	99 TO 03	M10X1.0	19
MERCEDES-BENZ	VITO 110 TD	2.3	TD	OM 601.970	99 TO 03	M12X1.25	1
MERCEDES-BENZ	VITO 110 CDI	2.2	CDi	OM 611.960	99 ON	M10X1.0	19
MERCEDES-BENZ	VITO 111 CDI	2.1	CDi	OM 646.982	99 TO 03	M10X1.0	19
MERCEDES-BENZ	VITO 112 CDI	2.2	CDi	OM 611.980	99 ON	M10X1.0	19
MERCEDES-BENZ	VITO 115 CDI	2.1	CDi	OM 646.982	03 ON	M10X1.0	19
MG	EXPRESS	2.0	8 VALVE TD	20T	03 ON	M10X1.0	12
MG	ZR	2.0	8 VALVE TD	20T	01 to 05	M10X1.0	12
MG	ZS	2.0	8 VALVE TD	20T	01 to 05	M10X1.0	12
MG	ZT/ZT-T	2.0	16 VALVE CDTi	M47R (BMW)	01 to 05	M10X1.0	12
MITSUBISHI	CARISMA	1.9		F8QT	97 TO 02	M12X1.25	2
MITSUBISHI	GALAXY I	1.9		F9QT	02 TO 04	M10X1.0	12
MITSUBISHI	CHALLENGER	2.5			98 ON	M10X1.25	6
MITSUBISHI	COLT Mk 2 -89	1.8			84 TO 88	M10X1.25	7
MITSUBISHI	L200 PICK UP	2.5		4D56	TO 93	M10X1.25	7
MITSUBISHI	L200 PICK UP	2.5		4D56	94 TO 98	M10X1.25	6
MITSUBISHI	L200 PICK UP	2.5		4D56	99 ON	M10X1.25	6
MITSUBISHI	L300 VAN	2.5		4D56	TO 92	M10X1.25	7
MITSUBISHI	L300 VAN	2.5		4D56	93 TO 96	M10X1.25	6
MITSUBISHI	L300 VAN	2.5		4D56	97 ON	M10X1.25	6
MITSUBISHI	SHOGUN	2.3		4D55	84 TO 86	M10X1.25	7
MITSUBISHI	SHOGUN	2.3		4D55	84 TO 86	M10X1.25	7
MITSUBISHI	SHOGUN	2.5		4D56	85 TO 90	M10X1.25	7
MITSUBISHI	SHOGUN	2.5		4D56	94 TO 95	M10X1.25	6
MITSUBISHI	SHOGUN	2.5		4D56	96 TO 00	M10X1.25	6
MITSUBISHI	SHOGUN	2.8		4M40T	94 to 00	M10X1.25	6
MITSUBISHI	SHOGUN SPORT	2.5			98 ON	M10X1.25	6
MITSUBISHI	SPACE STAR	1.9	DI-D	RENAULT	02 ON	M10X1.0	12
MITSUBISHI	SPACE WAGON	2.0	N38W	4D68	95 TO 96	M10X1.25	6
NISSAN	ALMERA 1	2.0		CD20	95 TO 99	M10X1.25	7
NISSAN	ALMERA 2	2.2		YD22DDT	02 ON	M10X1.0	20
NISSAN	ALMERA TINO	2.2		YD22DDT	00 ON	M10X1.0	20
NISSAN	BLUEBIRD	2.0		LD20, L20T	80 TO 81	M12X1.25	2
NISSAN	BLUEBIRD	2.0		LD20, L20T	82 TO 87	M10X1.25	11
NISSAN	BLUEBIRD	2.0		LD20	86 ON	M10X1.25	6
NISSAN	CABSTAR	2.3		LD23	00 TO 04	M10X1.25	6
NISSAN	CABSTAR	2.5		TD25	89 TO 92	M10X1.25	6
NISSAN	CABSTAR	2.7		TD27	00 TO 04	M10X1.25	6
NISSAN	CABSTAR	2.7	TURBO	TD27-T	93 TO 96	M10X1.25	6
NISSAN	CABSTAR	2.7	Di	TD27-Ti	02 TO 04	M10X1.25	6
NISSAN	INTERSTAR	1.9	dCi 82 PS	F9Q 772	02 ON	M10X1.0	12
NISSAN	INTERSTAR	2.2	dCi 90 PS	G9T 722	02 ON	M10X1.0	20

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FIAT	BRAVO	1.9	TD		96 TO 01	M12X1.25	1
FIAT	BRAVO	1.9	JTD	UP TO Eng No. 1716459	99	M10X1.0	15
FIAT	BRAVO	1.9	JTD	Eng. No.	99 ON	M10X1.0	15
FIAT	DOBLO	1.3	JTD		04 ON	M8X1.0	21
FIAT	DOBLO	1.9	Non Turbo	223 A6.000	01 ON	M12X1.25	2
FIAT	DOBLO	1.9	JTD	182.B9.000	02 ON	M10X1.0	15
FIAT	DUCATO	1.9			94 ON	M12X1.25	1
FIAT	DUCATO	1.9		8144.21.220	86 TO 94	M12X1.25	1
FIAT	DUCATO	2.0		149 B1.000	87 ON	M12X1.25	1
FIAT	DUCATO	2.0		280 A1.000	90 TO 94	M12X1.25	1
FIAT	DUCATO	2.0	JTD	RHV DW10	02 ON	M10X1.0	18
FIAT	DUCATO	2.5		8144.67	86 TO 94	M12X1.25	1
FIAT	DUCATO	2.5			82 TO 94	M12X1.25	1
FIAT	DUCATO	2.5		8140.47.2200	94 ON	M12X1.25	1
FIAT	DUCATO	2.5	4X4	8144.21.220	89 TO 94	M12X1.25	1
FIAT	DUCATO	2.5		8140.47.2280	94 ON	M12X1.25	1
FIAT	DUCATO	2.5	18 Maxi		86 TO 94	M12X1.25	1
FIAT	DUCATO	2.8		F28D	98 ON	M10X1.0	15
FIAT	FIORINO	1.3				M12X1.25	1
FIAT	FIORINO	1.5			93 ON	M12X1.25	1
FIAT	FIORINO	1.7				M12X1.25	1
FIAT	IDEA	1.3	JTD	188 A9.000	04 ON	M8X1.0	21
FIAT	MAREA	1.9	TD	182 A7.000, 182 A8.000	96 ON	M12X1.25	1
FIAT	MAREA	1.9	JTD	Eng. No. UP TO 1713819	99	M10X1.0	15
FIAT	MAREA	1.9	JTD	Eng. No. FROM 1713820	99 ON	M10X1.0	15
FIAT	MAREA	2.4	TD	185 A2.000	97 ON	M12X1.25	1
FIAT	MAREA	2.4	JTD	Eng. No.UP TO 1713819	99	M10X1.0	15
FIAT	MAREA	2.4	JTD	Eng. No. FROM 1713820	99 ON	M10X1.0	15
FIAT	MULTIPLA	1.9	JTD	Eng. No. FROM 1692992	99 ON	M10X1.0	15
FIAT	PANDA	1.3	JTD	188 A9.000	04 ON	M8X1.0	21
FIAT	PUNTO 1	1.7	NON TURBO	176 B3.000	95 TO 99	M12X1.25	1
FIAT	PUNTO 1	1.7	TD70	176 A3.000, 176 A5.000	94 TO 96	M12X1.25	1
FIAT	PUNTO 1	1.7	TD60S	176 B7.000	96 TO 99	M12X1.25	1
FIAT	PUNTO 2	1.9	NON TURBO	188 A3.000	99 ON	M12X1.25	2
FIAT	PUNTO 2	1.9	JTD	188 A2.000, 188 A7.000	99 ON	M10X1.0	15
FIAT	PUNTO 3	1.3	MULTIJET	188 A9.000	03 ON	M8X1.0	21
FIAT	PUNTO 4	1.9	JTD	188 B2.000	03 ON	M10X1.0	15
FIAT	PUNTO (GRANDE)	1.3	TD	188 A9.000	06 ON	M8X1.0	21
FIAT	PUNTO (GRANDE)	1.9	TD		06 ON	M10X1.0	15
FIAT	REGATA	1.9	TURBO		86 TO 90	M12X1.25	1
FIAT	SCUDO	1.9	DIESEL/TURBO DIESEL	XUD9TF	96 TO 98	M12X1.25	1
FIAT	SCUDO	1.9	PLUG Ø 12mm	XUD9TF	98 ON	M12X1.25	1
FIAT	SCUDO	1.9	NON TURBO	DW8	98 ON	M10X1.0	12
FIAT	SCUDO	2.0	JTD	RHX	00 TO 06	M10X1.0	18
FIAT	STILO	1.9	Plug Ø 10mm	192A1.000, 192A3.000	01 TO 06	M10X1.0	15
FIAT	TEMPRA	1.9	NON TURBO	160 A7.000	90 TO 96	M12X1.25	1
FIAT	TEMPRA	1.9	TURBO	160 A6.000, 160 D 1.000	90 TO 96	M12X1.25	1
FIAT	TIPO	1.7			88 TO 99	M12X1.25	1
FIAT	TIPO	1.9	TURBO		88 TO 92	M12X1.25	1
FIAT	TIPO	1.9	TURBO		92 ON	M12X1.25	1
FIAT	ULYSSE	1.9	TURBO	XUD9TF/L (D8B)	95 TO 00	M12X1.25	1
FIAT	ULYSSE	2.0	JTD 110	RHZ	00 TO 05	M10X1.0	18
FIAT	ULYSSE	2.2	JTD	DW12ATED	03 TO 06	M10X1.0	18
FIAT	UNO	1.7			87 ON	M12X1.25	1
FORD	COURIER VAN	1.6		LTB	84 TO 89	M12X1.25	1
FORD	COURIER VAN	1.8		RTC /D/G	89 ON	M12X1.25	1
FORD	COURIER VAN	1.8		(ENDURA-DI,-DE) RTK, J, N, P, Q	96 TO 00	M12X1.25	1
FORD	COURIER VAN	1.8	TDdi	RTN, RTP, RTQ	00 ON	M10X1.0	13
FORD	ESCORT (Incl. VAN)	1.6		LTC	84 TO 89	M12X1.25	1
FORD	ESCORT (Incl. VAN)	1.8		(D & DT) RTA /B/E/F/H, RFD/K	89 ON	M12X1.25	1
FORD	ESCORT (Incl. VAN)	1.8		(ENDURA-DE TCI) RFS, RVA	96 ON	M12X1.25	1
FORD	FIESTA III & IV	1.6		LTB	84 TO 89	M12X1.25	1
FORD	FIESTA III & IV	1.8		RTC /D/G	89 ON	M12X1.25	1
FORD	FIESTA III & IV	1.8		(ENDURA-DI,-DE) RTK, J, N, P, Q	96 TO 00	M12X1.25	1
FORD	FIESTA III & IV	1.8	TDdi	RTN, RTP, RTQ	00 ON	M10X1.0	13
FORD	FIESTA V	1.4		F6JA, F6JB (DV4TD)	02 TO 05	M8X1.0	21
FORD	FIESTA V	1.6		HHJA, HHJB	05 ON	M8X1.0	21
FORD	FOCUS I	1.8	TDdi	BHDA/B, C9DA..C	98 ON	M10X1.0	13
FORD	FOCUS I	1.8	TDCi	FFDA, F9DA, F9DB	01 ON	M10X1.0	13
FORD	FOCUS II	1.6		G8BA, G8DA	03 ON	M8X1.0	21
FORD	FOCUS C-MAX	1.6		G8DA	03 ON	M8X1.0	21
FORD	FUSION	1.4			02 ON	M8X1.0	21
FORD	FUSION	1.6		HHJA, HHJB	04 ON	M8X1.0	21
FORD	GALAXY I	1.9	TURBO	1Z	95 TO 96	M10X1.0	12

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FORD	GALAXY I	1.9	TURBO	1Z	96 TO 00	M10X1.0	13
FORD	GALAXY I	1.9	TURBO	AHU, AFN, AJM, ANU, ANF, AVG	95 TO 00	M10X1.0	13
FORD	GALAXY II	1.9	TURBO	ANU, AUY, ASZ, AZS1	00 ON	M10X1.0	13
FORD	GRANADA	2.5			81 TO 86	M12X1.25	1
FORD	GRANADA	2.5		SCB	86 TO 94	M12X1.25	1
FORD	MAVERICK	2.7	TURBO 100 PS	TD27	93 TO 96	M10X1.25	6
FORD	MAVERICK	2.7	TI-TURBO D 125 PS	TD27E	96 TO 98	M10X1.25	6
FORD	MONDEO I	1.8		RFM, RFN	93 TO 96	M12X1.25	1
FORD	MONDEO II	1.8		(ENDURA-DE TCI) RFN	96 TO 00	M12X1.25	1
FORD	MONDEO III	2.0	DURATORQ DI/TDCi 115	D5BA, D6BA	00 TO 07	M10X1.0	19
FORD	MONDEO III	2.0	DURATORQ TDCi 130	HJBA, HJBB, FMBA, N7BA	01 TO 07	M10X1.0	19
FORD	MONDEO III	2.2	DURATORQ TDCi 150/155	QJBA, QJBB, QJBC, QJBD	04 ON	M10X1.0	19
FORD	ORION	1.6			84 TO 89	M12X1.25	1
FORD	ORION	1.8			88 TO 93	M12X1.25	1
FORD	P100	1.8	TURBO DIESEL		89 ON	M12X1.25	1
FORD	P101	2.3			82 ON	M12X1.25	1
FORD	RANGER	2.5		WL, WLT	99 TO 02	M10X1.25	6
FORD	SCORPIO	2.5	VM 115 & 125	SCB, SCC, SCD	94 TO 98	M10X1.0	13
FORD	S-MAX	2.0	TDCi 130	AZWA	07 ON	M10X1.0	19
FORD	SIERRA	1.8	TURBO DIESEL		89 TO 93	M12X1.25	1
FORD	SIERRA	2.3			82 TO 90	M12X1.25	1
FORD	TOURNEO	2.0	DI & TDCI	D3FA, F3FA, ABFA, FIFA	00 ON	M10X1.0	19
FORD	TOURNEO CONNECT	1.8	TDCi	FFDA, F9DA, F9DB	01 ON	M10X1.0	13
FORD	TRANSIT	2.0	DI & TDCI	D3FA, F3FA, ABFA, FIFA	00 ON	M10X1.0	19
FORD	TRANSIT	2.4			83 TO 85	M12X1.25	1
FORD	TRANSIT	2.4	DI & TDCI	F4FA, D2FA, D4FA, DOFA	00 ON	M10X1.0	19
FORD	TRANSIT CONNECT	1.8	TDdi 75 ENDURA DI	BHPA	02 ON	M10X1.0	13
FORD	TRANSIT CONNECT	1.8	TDCi 8V 90 DURATORQ	HCPA	02 ON	M10X1.0	13
HONDA	ACCORD	2.0		20T2R, 20T2N	96 TO 98	M10X1.0	12
HONDA	CIVIC	2.0		20T2R, 20T2N	97 ON	M10X1.0	12
HONDA	ACCENT	1.5	TD/CRTD	D3EA	02 ON	M10X1.0	12 OR 13
HONDA	ELANTRA	2.0	CRDi	D4EA	02 TO 07	M10X1.0	12 OR 13
HONDA	GETZ	1.5	CRTD	D3EA	03 ON	M10X1.0	12 OR 13
HONDA	H100	2.5		4D55 D4BA	TO 96	M10X1.25	7
HONDA	H101	2.5		4D56 D4BF	97 ON	M10X1.25	6
HYUNDAI	MATRIX	1.5	CRTD	D3EA	01 ON	M10X1.0	12 OR 13
HYUNDAI	SANTA FE	2.0	CRDi	D4EA	01 TO 06	M10X1.0	12 OR 13
HYUNDAI	SANTA FE	2.2	CRDi	D4EB	06 TO 08	M10X1.0	12 OR 13
HYUNDAI	TERRACAN	2.9			03 ON	M10X1.25	6
HYUNDAI	TRAJET	2.0	CRTD	D4EA	01 ON	M10X1.0	12 OR 13
HYUNDAI	TUCSON	2.0	CRTD	D4EA	04 ON	M10X1.0	12 OR 13
ISUZU	TROOPER	3.1	TD	4JG2	92 TO 98	M10X1.25	6
IVECO	DAILY	2.5	Mk1 35	Sofim 8140.61	78 TO 90	M12X1.25	1
IVECO	DAILY	2.8	Mk2 29/35	Sofim 8140.63	99 ON	M10X1.0	15
JAGUAR	X-TYPE	2.0		FMBA/B	03 ON	M10X1.0	19
JEEP	CHEROKEE	2.5	TD 129 BHP	VM	92 TO 95	M12X1.25	1
JEEP	CHEROKEE	2.5	115	VM	95 TO 99	M10X1.0	13
JEEP	COMMANDER	3.0	V6 CRD		06 ON	M10X1.0	19
JEEP	GRAND CHEROKEE	2.5	115	VM	97 TO 99	M10X1.0	13
JEEP	GRAND CHEROKEE	2.7	CRD	CDI Mercedes	01 ON	M10X1.0	19
JEEP	GRAND CHEROKEE	3.1		EXA	98 ON	M10X1.0	13
KIA	CARENS	2.0	CRDi	D4EA	02 ON	M10X1.0	12 OR 13
KIA	CEE'D	2.0	CRDi	D4EA-F	08 ON	M10X1.0	16
KIA	CERATO	2.0	CRDi	D4EA	04 ON	M10X1.0	12 OR 13
KIA	MAGENTIS	2.0	CRDi	D4EA	06 ON	M10X1.0	12 OR 13
KIA	SORENTO	2.5	CRDi	D4CB	03 ON	M10X1.25	10
KIA	SPORTAGE	2.0	CRDi	D4EA	04 ON	M10X1.0	12 OR 13
LAND ROVER	90	2.5			83 ON	M12X1.25	1
LAND ROVER	110	2.5			83 ON	M12X1.25	1
LAND ROVER	DEFENDER	2.5		200 TDi / 300 TDi GEMINI	89 TO 98	M10X1.0	16
LAND ROVER	DISCOVERY	2.5		200 TDi / 300 TDi GEMINI	89 TO 98	M10X1.0	16
LAND ROVER	FREELANDER 1	2.0	TURBO	20 T2R	97 TO 00	M10X1.0	12
LAND ROVER	FREELANDER 2	2.0	Td4	M47R (BMW)	00 ON	M10X1.0	12
LAND ROVER	RANGE ROVER 1	2.4	TURBO 90bhp	VM UNIT	86 TO 89	M12X1.25	1
LAND ROVER	DISCOVERY	2.5	Tdi	200/300 TDI GEMINI	89 ON	M10X1.0	16
LAND ROVER	RANGE ROVER 2	2.5	DSE	M51 D25 (BMW)	94 ON	M12X1.25	1
LAND ROVER	RANGE ROVER 3	3.0	Td6	M57 D30 (BMW)	02 ON	M10X1.0	12
LDV	200 Series	1.9			94 TO 96	M12X1.25	1
LDV	201 Series	2.0	Di	BA50217	89 TO 94	M12X1.25	1
LDV	400 Series	2.5	D	PERKINS	89 TO 96	M12X1.25	1
LDV	401 Series	2.5	D	EN55 PEUGEOT	89 TO 96	M12X1.25	1
LDV	402 Series	2.5	TD	ET70 PEUGEOT	89 TO 96	M12X1.25	1
LDV	CONVOY	2.4	DI 75/90/125 FORD DURATORQ	F4FA, D3FA, D4FA	01 ON	M10X1.0	19
LDV	CONVOY	2.5	D	EN55 PEUGEOT	96 ON	M12X1.25	1

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LDV	CONVOY	2.5	TD	ET70 PEUGEOT	96 ON	M12X1.25	1
LDV	CUB	2.3		LD23	98 TO 02	M10X1.25	6
LDV	PILOT	1.9		PEUGEOT XUD9A/L3	96 TO 02	M12X1.25	1
LDV	PILOT	1.9		DW8B/L4	01 ON	M10X1.0	12
LDV	SHERPA	1.8			74 TO 86	M12X1.25	1
LDV	SHERPA	2.0		PERKINS PRIMA	86 TO 88	M12X1.25	1
LDV	SHERPA	2.5			86 TO 89	M12X1.25	1
LDV	SHERPA	2.5		PEUGEOT ENGINE	89 ON	M12X1.25	1
MAZDA	121	1.8		RTJ (ENDURA)	96 TO 97	M12X1.25	1
MAZDA	2	1.4	MZ-CD	F6JA	02 TO 07	M8X1.0	21
MAZDA		1.4	D-TS	F6JA	08 ON	M8X1.0	21
MAZDA	3	1.6			03 ON	M8X1.0	21
MAZDA	323	2.0		RF	99 ON	M10X1.25	6
MAZDA	5	2.0	110 & 143	RF	05 ON	M10X1.25	6
MAZDA	6	2.0		RF	02 ON	M10X1.25	6
MAZDA	626	2.0		RF-CX	94 TO 95	M10X1.25	6
MAZDA	626	2.0		RF	98 TO 03	M10X1.25	6
MAZDA	B2200	2.2		R2	TO 96	M10X1.25	6
MAZDA	B2500 PICK UP	2.5		WL,WLT	98 TO 03	M10X1.25	6
MAZDA	E2200	2.2	UP TO CHASSIS 805981	F2, R2	84 TO 96	M10X1.25	6
MAZDA	E2200	2.2	FROM CHASSIS Vin 805982	R2	96 ON	M10X1.25	6
MAZDA	MPV	2.0		RF	02 ON	M10X1.25	6
MAZDA	PREMACY	2.0		RF	99 ON	M10X1.25	6
MERCEDES-BENZ	190	2.0		OM 601	83 TO 89	M12X1.25	1
MERCEDES-BENZ	190	2.0		OM 601	89 TO 93	M12X1.25	1
MERCEDES-BENZ	190	2.5		OM 602	85 TO 89	M12X1.25	1
MERCEDES-BENZ	190	2.5		OM 602	89 TO 93	M12X1.25	1
MERCEDES-BENZ	190	2.5	DT	OM 602.961	89 TO 93	M12X1.25	1
MERCEDES-BENZ	200	2.0			80 ON	M12X1.25	1
MERCEDES-BENZ	200	2.0	TURBO		80 ON	M12X1.25	1
MERCEDES-BENZ	207	2.4			82 TO 89	M12X1.25	1
MERCEDES-BENZ	208	2.3		OM 601	88 ON	M12X1.25	1
MERCEDES-BENZ	209	3.0			82 TO 89	M12X1.25	1
MERCEDES-BENZ	210	2.9		OM 602	88 ON	M12X1.25	1
MERCEDES-BENZ	220	2.0			80 TO 85	M12X1.25	1
MERCEDES-BENZ	240	2.4			80 TO 89	M12X1.25	1
MERCEDES-BENZ	250	2.5		OM 612.912, 962	85 TO 89	M12X1.25	1
MERCEDES-BENZ	250	2.5		OM 612.912, 962	89 TO 93	M12X1.25	1
MERCEDES-BENZ	300	3.0		OM 603.912, 913, 960, 963	85 TO 89	M12X1.25	1
MERCEDES-BENZ	300	3.0		OM 603.912, 913, 960, 963	89 TO 93	M12X1.25	1
MERCEDES-BENZ	307	2.4			82 TO 89	M12X1.25	1
MERCEDES-BENZ	308	2.3		OM 601	88 TO 95	M12X1.25	1
MERCEDES-BENZ	309	3.0			82 TO 89	M12X1.25	1
MERCEDES-BENZ	310	2.9			82 TO 89	M12X1.25	1
MERCEDES-BENZ	310	2.9		OM 602	88 TO 95	M12X1.25	1
MERCEDES-BENZ	407	2.4			81 TO 89	M12X1.25	1
MERCEDES-BENZ	408	2.3		OM 601	88 TO 95	M12X1.25	1
MERCEDES-BENZ	409	3.0			82 TO 89	M12X1.25	1
MERCEDES-BENZ	410	2.9		OM 602	90 TO 95	M12X1.25	1
MERCEDES-BENZ	508	2.3		OM 601	89 TO 95	M12X1.25	1
MERCEDES-BENZ	A160 CDI	1.7	168 Series	OM 668.940, OM 668.941	98 TO 05	M10X1.0	16 OR 19
MERCEDES-BENZ	A160 CDI	1.7	169 Series	OM 668.942	01 TO 06	M10X1.0	16 OR 19
MERCEDES-BENZ	A170 CDI	1.7	168 Series	OM 668.940, OM 668.942	98 TO 05	M10X1.0	16 OR 19
MERCEDES-BENZ	C200 CDI	2.1	203 Series	OM 646.962	03 ON	M10X1.0	19
MERCEDES-BENZ	C220D	2.2		OM 604.910	93 TO 98	M12X1.25	3
MERCEDES-BENZ	C220D	2.2		OM 611.913, 915	96 ON	M12X1.25	3
MERCEDES-BENZ	C220 CDI	2.2	202 Series	OM 611.960, 961, 962	99 ON	M10X1.0	19
MERCEDES-BENZ	C220 CDI	2.2	203 Series	OM 611.962, OM 646.963	02 ON	M10X1.0	19
MERCEDES-BENZ	C250D	2.5		OM 605.910	93 TO 98	M12X1.25	3
MERCEDES-BENZ	C250TD	2.5		OM 605.960	96 TO 99	M12X1.25	3
MERCEDES-BENZ	C270 CDI	2.7	203 Series	OM 612.962	01 ON	M10X1.0	19
MERCEDES-BENZ	CLK270 CDI	2.7	209 Series	OM 612.962, OM612.967	02 ON	M10X1.0	19
MERCEDES-BENZ	E220 CDI	2.2		OM 604.912	96 TO 99	M12X1.25	3
MERCEDES-BENZ	E220 CDI	2.1	210 Series	OM 611.961	99 TO 02	M10X1.0	19
MERCEDES-BENZ	E220 CDI	2.1	211 Series 150bhp	OM 646.961	02 TO 06	M10X1.0	19
MERCEDES-BENZ	E250	2.5		OM 605.912,962	93 TO 95	M12X1.25	1
MERCEDES-BENZ	E251	2.5		OM 605.911	93 TO 95	M12X1.25	3
MERCEDES-BENZ	E253	2.5		OM 605.911	93 ON	M12X1.25	3
MERCEDES-BENZ	E270 CDI	2.7	211 Series	OM 646.961	02 ON	M10X1.0	19
MERCEDES-BENZ	E280 CDI	3.2	211 Series	OM 648.961	05 TO 06	M10X1.0	19
MERCEDES-BENZ	E300D	3.0		OM 606.910	93 TO 95	M12X1.25	3
MERCEDES-BENZ	E300TD	3.0		OM 603.960	93 TO 95	M12X1.25	1
MERCEDES-BENZ	E300TD	3.0		OM 606.910,912,962	93 ON	M12X1.25	3
MERCEDES-BENZ	E320 CDI	3.2	210 Series	OM 613.961	99 TO 02	M10X1.0	19

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Instruction

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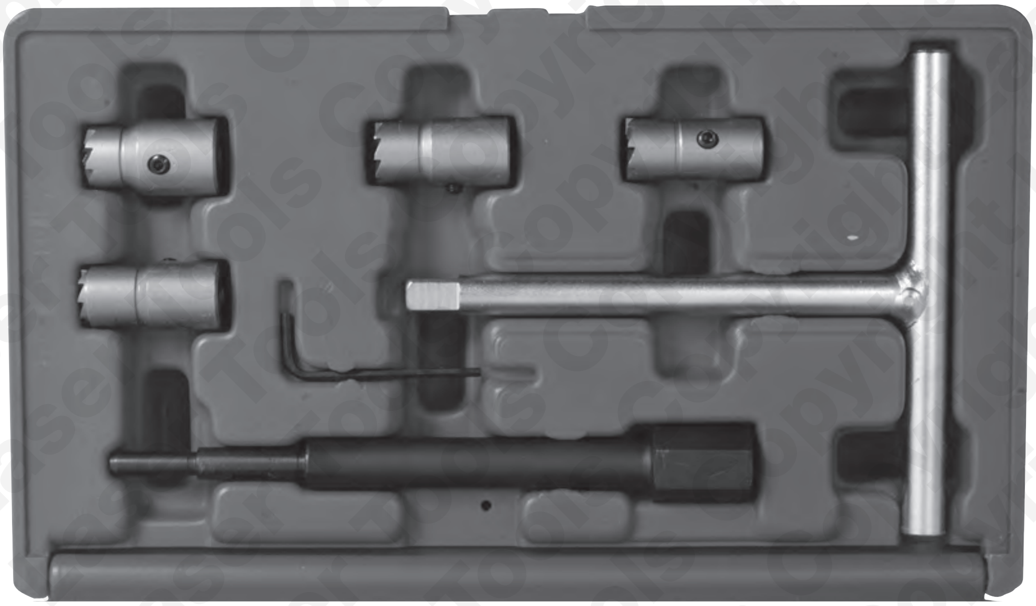
Diesel Injector Seat Cutter Set

For use with BMW | Mercedes-Benz | PSA | Renault



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Diesel Injector Seat Cutter Set – BMW | Mercedes-Benz | PSA | Renault

This set of four Diesel Injector cutters ensures that the injector seat is bored to the exact dimension when replacing or reconditioning the diesel injectors.

Injector blow-by can be the cause of many problems on Common Rail Diesel engines including:

- Problems with starting
- Uneven tick over
- Lumpy running
- Hesitation on acceleration
- Smoke on tick over or acceleration
- Black tar around the injectors
- Chuffing sound from the engine when running

These problems will affect the ECU and can cause over fuelling of the cylinder head.

Even after the diesel injector is removed, cleaned and a new copper washer fitted it may not always rectify the problem.
Often the seat of the injector has been damaged due to constant erosion from escaping combustion gases.
The only way to reface the seat is gently reface the seat in the cylinder head.

Contents
Centring Pilot
T Handle Driver
Cutters:
17mm flat cutter with 19mm external diameter - Mercedes-Benz CRD
17mm angled cutter with 21mm external diameter - Fiat | Iveco
17mm flat cutter with 17mm external diameter - BMW | PSA | Renault
15mm flat cutter with 19mm external diameter - Other makes

Copper Washer remover and installer kit now available.
Laser Part No. 4702

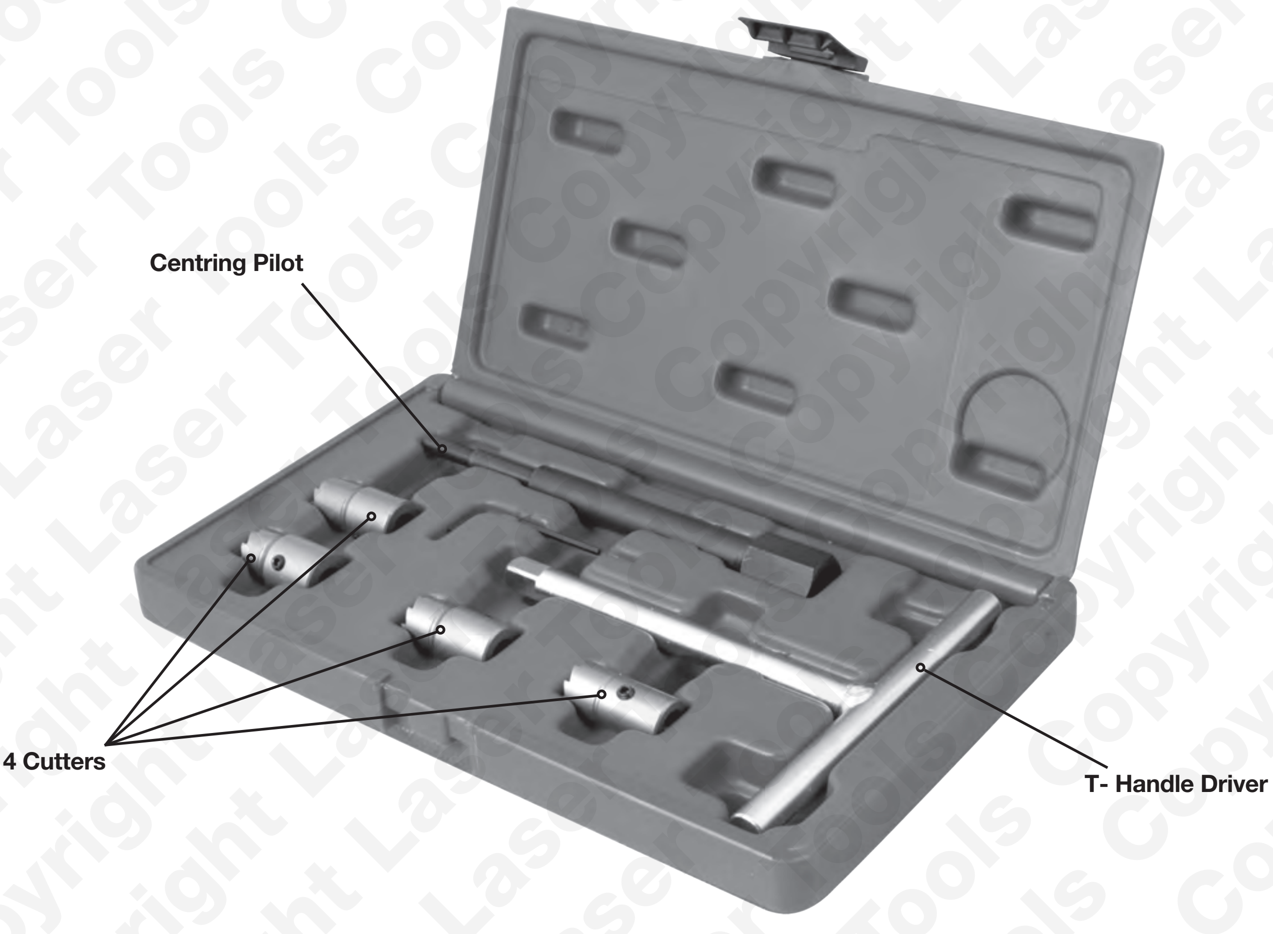
Instructions

Remove engine cowling and covers
The sight you see may be frightening.

- Various products are on the market for cleaning the carbon from this area which not only makes the whole are look better but will assist with injector removal.
- Laser Tools have various Diesel Injector removal kits which help this task and invariably they include a sliding hammer and claws for sliding beneath the injector.
- Often the diesel injectors will need to be replaced as removal can be quite brutal.
- Remove the copper heat shield washer so that the cylinder seat can be cleaned.
- Again another tool for removing this copper washer is included in the Laser Specialist range of tools. Part No
- Select the size of seat cutter required
- Place the seat cutter in the injector recess and with a little downward pressure rotate in a clockwise direction for a few turns.
- Spray a small amount of lubricant on the teeth of the cutter to ensure a smooth finish.
- Remove the seat cutter and clean the aperture with compressed air or suction cleaner.
- Clean and inspect the seat.
- Continue gradually until you are left with a clean seat that will take the new copper washer seal.

Refitting Injectors

- Leave the inlet plastic protective plugs on
- Remove the nozzle protective cap
- Paste the copper washer onto the injector nozzle using white grease (not Copper Slip Grease), making sure it is secure and will not fall off when replacing the injector into the recess.
- Smear the injector body with more white grease and insert into the seat.
- Re-fit the injector clamp and tighten to specifications.
- Continue with the remaining injectors.
- Allow the engine to tick over gently when first started.
- To check for blow-by, make a solution of dish washer soap and water and squirt this around the injector when the engine is ticking over.



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Diesel Injector Remover

VAG - TDI

Instruction

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Diesel Injector Remover – Volkswagen Audi Group - TDi

Engine codes ALH | AHU | 1Z

This specialist kit is designed primarily for removing seized diesel injectors from VAG TDi engines.
The set includes a 0.5kg slide hammer with threaded adaptors in direct, offset and hook profiles.

Always allow the engine to cool down (at least 4 hours) before attempting to remove the injectors.

It can be beneficial to only work on two injectors at a time (cylinders 2&3) and then re-start the engine, then proceed to work on (cylinders 1&4).

Instructions

1. Remove the fasteners holding the engine cover.
2. To ensure dirt or carbon does not go into the fuel system; make sure all areas around the fuel lines are clean.
3. Remove the plastic clips from the fuel lines.
4. Remove the braided fuel return line from the fuel pump to the No 4 injector and unclip from the vacuum reservoir.
5. Using a 17mm Flare nut Wrench (Part No. 4035) loosen the fuel lines at the pump and move them to one side to permit more access.
6. Lift all lines away from injectors. (Be careful to remove in sequence and do not bend or stretch them)
7. Ensure any fuel spills are wiped away.
8. Undo all clamps and initially try to loosen injectors.
9. Remove the needle lift sensor from No 3 Injector.
10. Remove remaining injector holders (13mm Socket)
11. Be careful to retain the special nut(s) and washer(s)
12. It is easier to leave the inter-injector fuel return lines on the injectors and disconnect them on the work bench following removal.

Removing the injectors

1. Clean up any carbon or build up on the injector holders to ensure a good seal when replacing.
2. Laser Tool's Injector Seat Cutter is available for this operation (Part No: 4597)
3. Use an air tool or vacuum suction to remove any loose debris around the injector seats.
4. It is advisable to always use a new sealing washer.
5. Take extra care not to damage the face of the copper washer as this is vital to ensure a correct seal.
6. Reverse the removal process and reinstall the injectors (new or reconditioned)
7. Add a spot of grease to the sealing washer to make sure it remains in place.
8. Re-install the injector holders and tighten to required torque.
9. Re-attach the inter-injector fuel return lines, glow plug harness and all electrical connections.
10. Lower fuel lines towards injectors, press the line into the injector and tighten by hand.
11. Correctly torque down the injector side nuts.

Consult your workshop manual for the correct re-starting procedures.

The engine may shudder and stutter to start with but should settle down.

Check engine bay for leaks or loose wires, tools etc.

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Instruction

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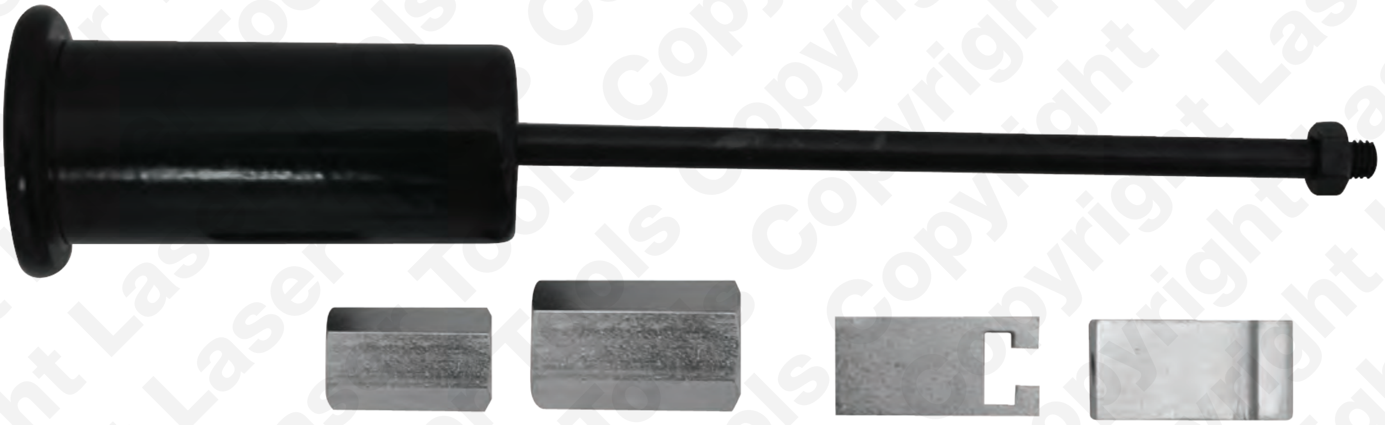
Diesel Injector Remover

VAG - TDI



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Diesel Injector Remover – Volkswagen Audi Group - TDi

Engine codes ALH | AHU | 1Z

This specialist kit is designed primarily for removing seized diesel injectors from VAG TDi engines.
The set includes a 0.5kg slide hammer with threaded adaptors in direct, offset and hook profiles.

Always allow the engine to cool down (at least 4 hours) before attempting to remove the injectors.

It can be beneficial to only work on two injectors at a time (cylinders 2&3) and then re-start the engine, then proceed to work on (cylinders 1&4).

Instructions

1. Remove the fasteners holding the engine cover.
2. To ensure dirt or carbon does not go into the fuel system; make sure all areas around the fuel lines are clean.
3. Remove the plastic clips from the fuel lines.
4. Remove the braided fuel return line from the fuel pump to the No 4 injector and unclip from the vacuum reservoir.
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6. Lift all lines away from injectors. (Be careful to remove in sequence and do not bend or stretch them)
7. Ensure any fuel spills are wiped away.
8. Undo all clamps and initially try to loosen injectors.
9. Remove the needle lift sensor from No 3 Injector.
10. Remove remaining injector holders (13mm Socket)
11. Be careful to retain the special nut(s) and washer(s)
12. It is easier to leave the inter-injector fuel return lines on the injectors and disconnect them on the work bench following removal.

Removing the injectors

1. Clean up any carbon or build up on the injector holders to ensure a good seal when replacing.
2. Laser Tool’s Injector Seat Cutter is available for this operation (Part No: 4597)
3. Use an air tool or vacuum suction to remove any loose debris around the injector seats.
4. It is advisable to always use a new sealing washer.
5. Take extra care not to damage the face of the copper washer as this is vital to ensure a correct seal.
6. Reverse the removal process and reinstall the injectors (new or reconditioned)
7. Add a spot of grease to the sealing washer to make sure it remains in place.
8. Re-install the injector holders and tighten to required torque.
9. Re-attach the inter-injector fuel return lines, glow plug harness and all electrical connections.
10. Lower fuel lines towards injectors, press the line into the injector and tighten by hand.
11. Correctly torque down the injector side nuts.

Consult your workshop manual for the correct re-starting procedures.

The engine may shudder and stutter to start with but should settle down.

Check engine bay for leaks or loose wires, tools etc.

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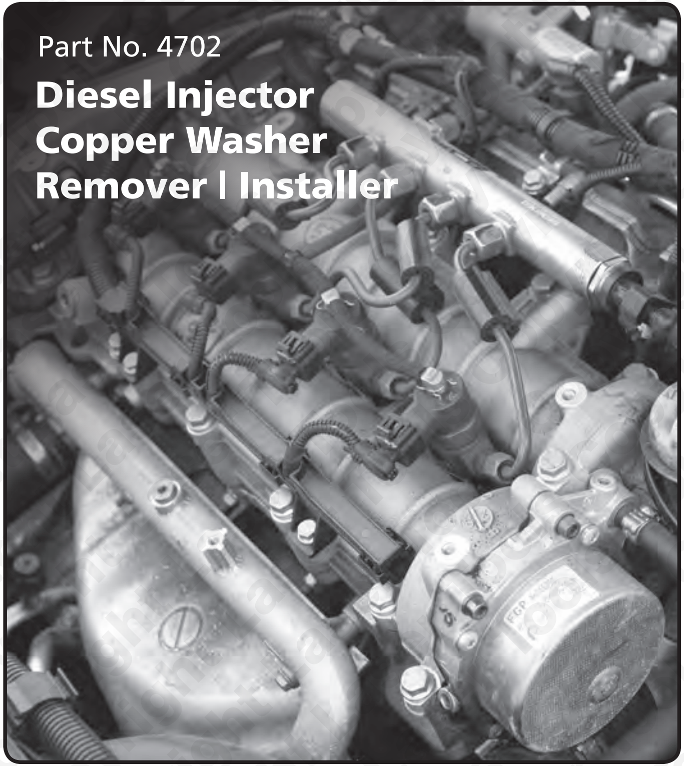

Part No. 4702

Diesel Injector Copper Washer Remover | Installer

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Diesel Injector Copper Washer Remover | Installer

Injector blow-by can be the cause of many problems on Common Rail Diesel engines including:

- Problems with starting
- Uneven tick over
- Lumpy running
- Hesitation on acceleration
- Smoke on tick over or acceleration
- Black tar around the injectors
- Chuffing sound from the engine when running
- These problems will affect the ECU and can cause over fuelling of the cylinder head.

Even after the diesel injector is removed, cleaned and a new copper washer fitted it may not always rectify the problem.

Often the seat of the injector has been damaged due to constant erosion from escaping combustion gases.

The only way to reface the seat is gently reface the seat in the cylinder head.

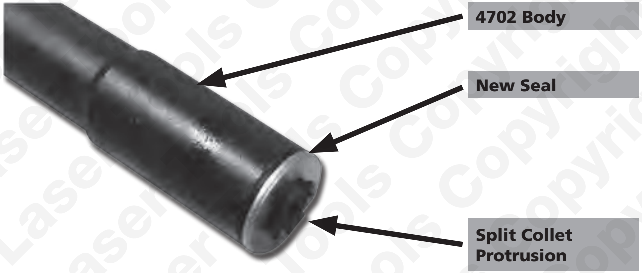
To do this the Copper Washer must be removed.

This Copper Washer Removal Tool is used in conjunction with the Laser Diesel Injector Cutter Tool Set (Part No 4597)

Instructions for use:

1. To remove the copper seal from the engine the 4702 must first have the protrusion of the split collet set according to the thickness of the seal to be removed.
2. To set the collet, first ensure the large knurled nut on the top of the tool is lose enough to allow the collet to be turned in the tool body. The split collet protrusion can now be adjusted by winding it into or out of the body.

TIP: use a new seal to set the protrusion. Set the protrusion so the collet just sits proud of the seal as shown.



3. Remove the seal used to set the protrusion from the tool and insert the tool collet, end down first into the injector tube.
4. Once the collet is located into the centre of the fixed seal tighten the knurled nut so the collet grips the seal and pulls the washer out.
5. Remove the old seal from the tool by loosening the knurled nut and using your fingers release the collet from the seal.
6. Ensure the protrusion of the collet is still set and repeat for all injector seals

Allow the engine to tick over gently when first started.

To check for blow-by, make a solution of dish washer soap and water and squirt this around the injector when the engine is ticking over.

Incorrect or out of phase engine timing can result in damage to the valves. The Tool Connection cannot be held responsible for any damage caused by using these tools in anyway.

Safety Precautions – Please read

- Disconnect the battery earth leads (check radio code is available)
- Remove spark or glow plugs to make the engine turn easier
- Do not use cleaning fluids on belts, sprockets or rollers
- Always make a note of the route of the auxiliary drive belt before removal
- Turn the engine in the normal direction (clockwise unless stated otherwise)
- Do not turn the camshaft, crankshaft or diesel injection pump once the timing chain has been removed (unless specifically stated)
- Do not use the timing chain to lock the engine when slackening or tightening crankshaft pulley bolts
- Do not turn the crankshaft or camshaft when the timing belt/chain has been removed
- Mark the direction of the chain before removing
- It is always recommended to turn the engine slowly, by hand and to re-check the camshaft and crankshaft timing positions.
- Crankshafts and Camshafts may only be turned with the chain drive mechanism fully installed
- Do not turn crankshaft via camshaft or other gears
- Check the diesel injection pump timing after replacing the chain
- Observe all tightening torques
- Always refer to the vehicle manufacturer’s service manual or a suitable proprietary instruction book
- Incorrect or out of phase engine timing can result in damage to the valves
- It is always recommended to turn the engine slowly, by hand, and to re-check the camshaft and crankshaft timing positions
- Always wear gloves, safety goggles and safety boots.
- Always tighten components to the manufacturers recommended torque settings
- Where injectors are badly sieved due to corrosion/carbon build up it is advised that the injectors be soaked over night in a cleaning agent to soften the build up
- Cleanliness is essential, dirt and carbon can easily fall into the cylinder when the injector is removed

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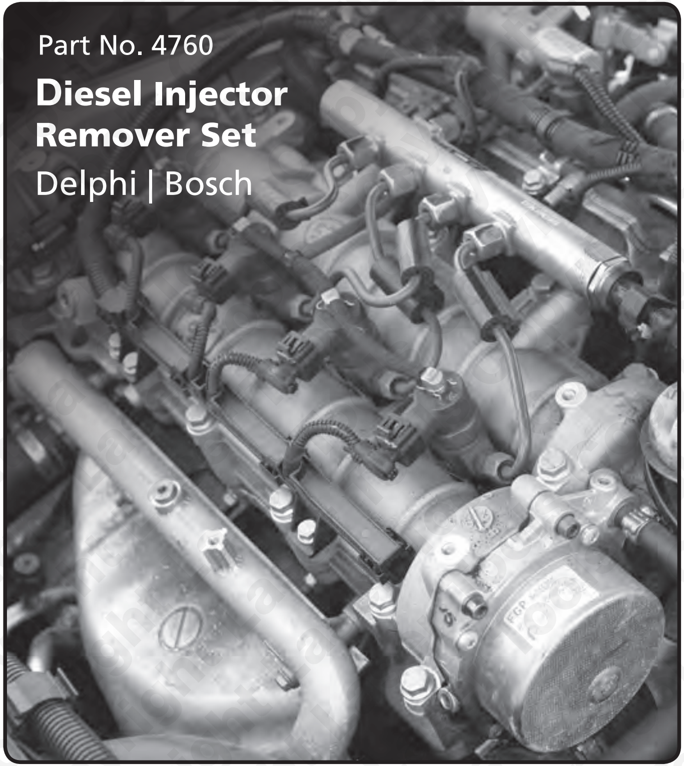
Part No. 4760

Diesel Injector Remover Set

Delphi | Bosch



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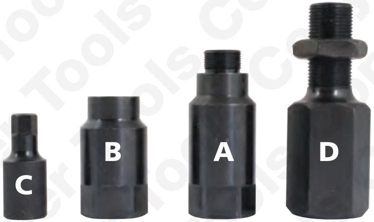
Diesel Injector Removal Set

The 4760 set is a professional kit designed to allow the user to remove stubborn stuck Bosch and Delphi common rail diesel injectors using a slide hammer (Part No 4811 slide hammer available separately).
The 4760 set includes the special hexagon key required to remove the internal components from the injectors which allows the stronger injector internal threads to be used for pulling.

Note: The 4760 adaptors have a M20 internal thread to allow the use of a slide hammers fitted with a M20 metric thread.

Applications: Bosch and Delphi Common Rail Diesel Injectors.



Ref	Size	Description
A	M20 x M17 x 1.0	Bosch injector adaptor
B	M20 x M14 x 1.5	Delphi injector adaptor
C	M10 x 1/2” with hole	Injector insert tool
D	M20 x 5/8”UNF	Slide hammer adaptor with locknut

Instruction

Preparation

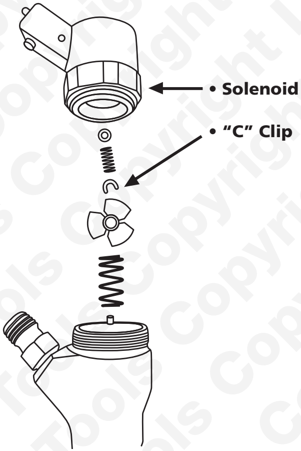
- Remove fuel and engine components required to access the injectors.
- Clean the areas around the injectors, if necessary soak the area in asuitable cleaning agent to help soften significant carbon/corrosion build up.
- Remove the electrical connections from the injectors.
- Remove the Low and high pressure fuel pipes from the injectors.

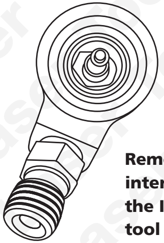
(N.B. the injection system manufacturers recommend the replacement of metal High pressure injection pipes if removed, see manufacturers recommendations)

- Many Common Rail injection systems have coded injectors, it is advised anote is made of the injector numbers and the cylinders they came from.
- Remove the injector solenoid
  (Sockets 4843 available separately)
- Remove the internal components of the injector.
- Bosch – press down on the internal components and slide out the small central “C” clip, lift out the internal components (these components are very small so great care should be exercised not to loose or mix up these components)
- Using the Injector Insert Tool (C) remove the injector lower internal components.
- Remove the injector fixings/clamps.
- Thread the correct adaptor (dependent on injector type) into the injector. It is recommended that this adaptor is tightened briefly using an air impact wrench as the vibration will help loosen the injector. Stop immediately if the injector starts to spin as the injector HP connection port could foul on the rocker box etc.
- Where the slide hammer to be used has a M20 thread on it, the Slide Hammer Adaptor is not required. Where the slide hammer to be used has a 5/8” UNF thread the Adaptor must be used and properly tightened in place using the locking nut provided.

• The injector is now ready for removal.

Additional information:
Due to the length of the 4811 slide hammer it may be necessary to remove the vehicles bonnet to allow access in some extreme cases where the engine if reclined in the engine bay access can only be gained by removal of the engine (for example: Citroen C8/Peugeot 807 HDi diesels)





Remove the lower internals using the Injector insert tool provided

LASER®

Diesel Injector Puller Set

Mercedes Benz Sprinter
E-Class | C-Class

Instructions

4762

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Diesel Injector Puller Set

This 3 piece Diesel Injector Puller Set comes complete with an extractor key for removing the inner part of the injector. It is also suitable for removing injectors without the use of a slide hammer and without removing the cam cover off or damage to the cylinder head.

Applications

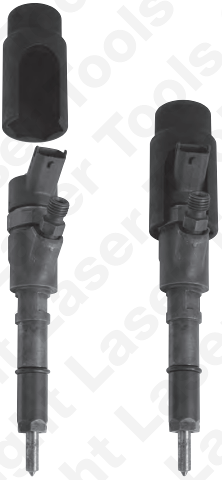
Mercedes Benz Sprinter | E-Class | C-Class

Contents

1. Diesel Injector Impact Socket 1/2"D 29mm.
2. Special 10mm Hex extractor key 1/2"D.
3. Support Shaft Bearing assembly with widen shoulders for cylinder head protection.

Instructions

1. With 29mm diesel injector window socket screw off the nozzle head of the injector.
2. Using special 10mm Hex extractor key remove the insert from the injector.
3. Place the Support Shaft bearing assembly over the injector ensuring the wide shoulders of the shaft support the tool.
4. With a 10mm spanner or socket screw the shaft down into the injector.
5. With a 24mm spanner or socket and an anti-clockwise motion draw the injector out of the cylinder head.



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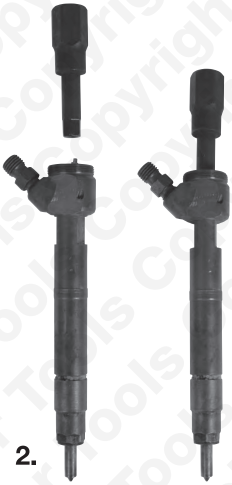

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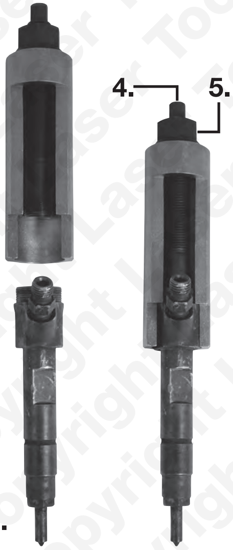

3.

If the injector is still too tight to remove the Laser **4335** has 3 more robust methods to remove injectors from CDi engines.

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recycle

When you have finished with this leaflet please recycle it

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LASER®

Part No. 5260

Diesel Injector Fuel Return Flow Tester

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Diesel Injector Fuel Return Flow Tester

Designed for use on the injector return side of a common rail diesel system, measures return fuel flow on engines up to ten injectors in one test.

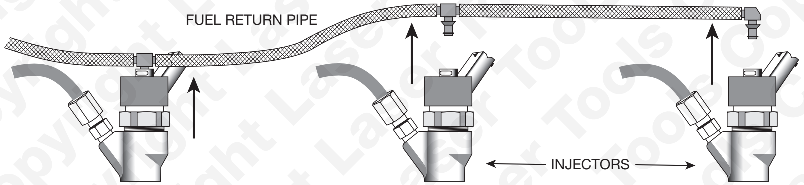
Assists with diagnosis of:

- Poor or no engine starting
- Rough running
- Poor acceleration
- Overall lack of engine power
- Smoke on tick-over or acceleration

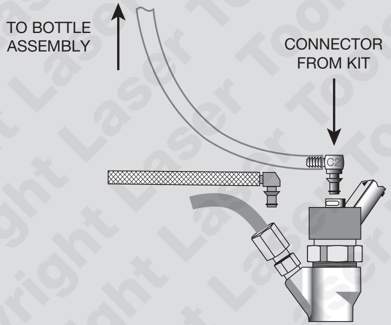
Pressure loss on a common rail fuel system can often result in one or more of the above symptoms. A common reason for pressure loss is excessive fuel being returned to the fuel tank (also referred to as 'back leakage'). If the injector(s) suffer from excessive back leakage, the fuel pump cannot generate enough pressure to let the system operate correctly. This can be more obvious at start and tick-over as fuel pressure is directly related to engine revolutions.

Instructions:

1. Modern engines are usually fitted with a sound deadening cover over the top of the engine. Remove this cover to gain access to the injectors.
2. The fuel return pipe connectors are secured with wire clips. Remove these and store in a safe place.
3. Ease off the return pipe connectors from the injectors; take care with this operation as the connectors can be brittle.

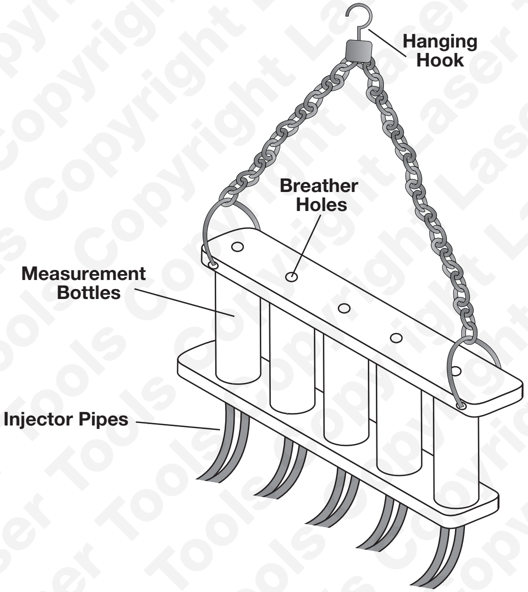


4. Plug or clamp the ends of the return pipes to avoid spillage
5. Hang the bottle assembly in a suitable position under the bonnet.
6. Choose the correct connectors from the kit and fit to the ends of the flexible pipes. These are a push fit into the pipe.
7. Connect the flexible pipes to the injectors. They do not require the wire clip to secure (return system is low pressure).



Instructions – Checking The Timing

8. Start the engine and leave to tickover.
9. Watch the bottles and stop engine when they are approximately 75% full.
10. Compare the levels across the bottle assembly. A bottle showing more than 10% extra fuel points to an injector that may have a back leakage problem.



11. Remove each flexible pipe from the injectors; to help avoid spillage, place a finger over each bottle vent (top of bottle assembly) as the pipe is being removed. Pinch pipe to hold back the fuel and then drain the fuel into an appropriate container.
12. Refit the return pipe connectors to the injectors and secure with the wire clips.
13. Start engine again and carefully check all previously removed connectors for leaks.

NOTE: Instructions are for guidance only. Please refer to the manufacturer's service manual.

Precautions:

- Designed for use on the return side of the injector. DO NOT connect to the high pressure side.
- Keep tool clean and dust free.
- Wear eye protection when using.

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5478

LASER®

Injector Puller TDi PD

Instructions

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Injector Puller TDi PD

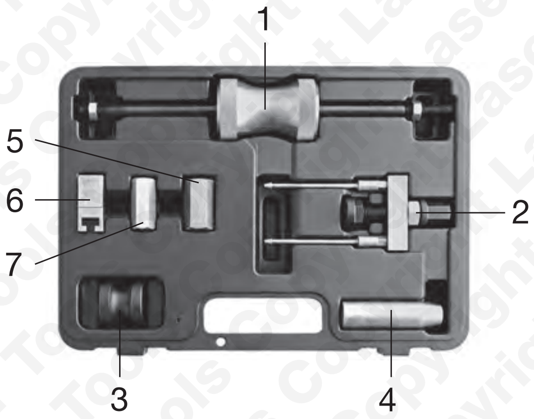
Enables the easy extraction of the Volkswagen and Audi PD type diesel injectors for the following models:

Applications

1.4 SDi/TDi | 1.9D/SDi/TDi (PD) | 2.0TDi (PD)
4-valves 2.5 TDi 2.5TDi (PD) | 2.8TDi (PD)
2.7/3.0TDi (PD)

Although the injectors don't suffer seizure like other types, the removal can be tricky due to limited space. This can sometimes lead to technicians using unsuitable tooling which can result in damage to the injectors themselves or the solenoids. The set is supplied in a sturdy blow mould case.

Components: (Refer to diagram)	
1	Slide hammer
2	Direct overhead grip
3	Slide hammer hand grip
4	Offset adaptor
5	22mm adaptor
6	Hook adaptor
7	17mm adaptor



Instructions

As the set provides pulling methods for a number of different engine applications, the manufacturer's documentation or workshop manual must be referred to before the injector(s) can be removed. For example, the cam cover must be removed, in some applications the camshaft has to be set to a particular position, rocker arms may have to be removed, or the rocker arm shaft may have to be removed.

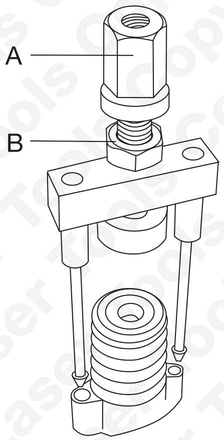
When refitting the injector or a new injector, pay particular attention to the manufacturer's installation sequence, regarding the pressing of the injector unit into the head, the alignment of the injector unit, the tightening sequence of the securing bolts and any final adjustment of the rocker arm setting (usually using a dial gauge).

The kit includes two methods of pulling: using the direct overhead grip (2) or the offset or hook adaptors (4 and 6). Use the suitable method according to the design of PD injector and how it is secured to the cylinder head.

To ensure dirt, oil or carbon does not enter the fuel system, clean all around the injector(s) to be removed, and around the fuel lines, etc.

Assemble the slide hammer by screwing hand grip (3) onto slide hammer shaft.

Using the Direct Overhead Grip



Once access has been gained to the injector unit to be removed (refer to manufacturer's documentation — see above), pull ball stud out of the top of the injector unit (if fitted).

Undo the injector unit securing bolts using the special spline bit wrench (Laser Tools 5479).

Fit the Direct Overhead Grip (2) over the injector inserting the feet into the bolt holes on the injector unit. (Refer to diagram)

Turn the puller spindle (A) down lightly onto the top of the injector unit to apply slight pressure.

Then hand-tighten the lock nut (B).

Screw the shaft of the slide hammer onto puller Spindle (A). Then pull injector unit upwards out of cylinder head with careful, steady use of the slide hammer.

Using the Offset or Hook Grips

This type of injector unit will be secured by a tensioning block that locates in a slot in the side of the injector unit.

Once access has been gained to the injector unit to be removed (refer to manufacturer's documentation — see above), remove the tensioning block securing bolts using the special spline bit wrench (Laser Tools 5479). Then remove the block.

Assemble the suitable adaptor to the slide hammer and grip the injector unit. Then carefully pull injector unit upwards out of cylinder head with careful, steady use of the slide hammer, holding the injector unit so that it does not twist or cant over as it comes out.

Precautions

- If work is performed that requires adjustment of the injector unit via adjustment screw, the adjustment screw in the rocker arm and also the injector unit ball stud must be renewed, otherwise excessive wear of the components will result.
- It is strongly recommended to use new securing bolts for the injector units.
- Replace all relevent seals as recommended in the manufacturer's documentation
- The injector should be re-seated using the manufacturer's instructions (a special tool is sometimes required). If the injector unit is pulled down by the securing bolts there is a risk of the injector not being pulled correctly into its seat. This can result in engine running and starting problems. Thus the injector unit can only be secured after it has been correctly seated.
- To secure the injector unit, carefully screw in the new bolts using the special spline bit wrench (Laser Tools 5479). Then tighten following the manufacturer's recommendation.

Safety Instructions:

- Wear eye protection when using this equipment.
  Be especially aware of sharp metal swarf and sticky grease / lubricant.
- DO NOT USE AIR TOOLS WITH THIS PRODUCT.

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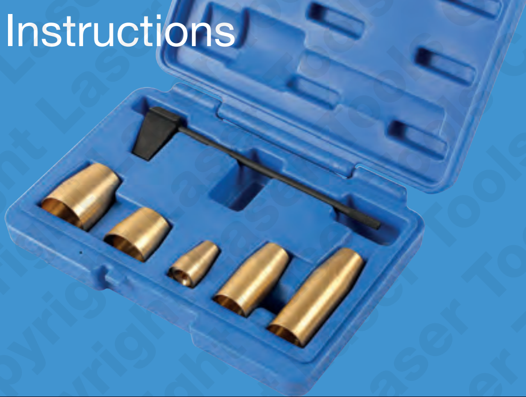
6249

LASER®

PD Injector Alignment Kit

VAG

Instructions



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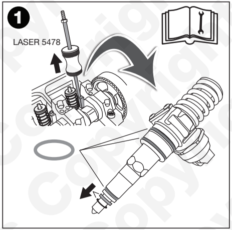
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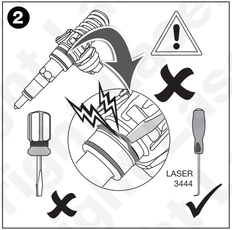
LASER 5478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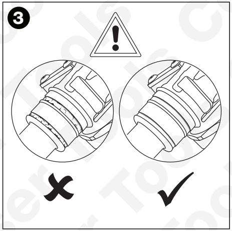
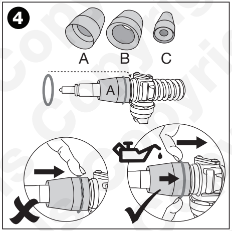
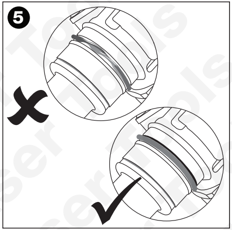
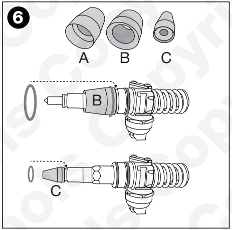
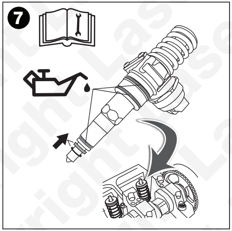
LASER 3444

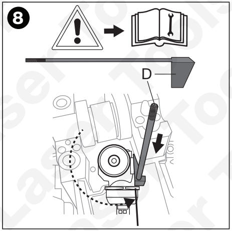












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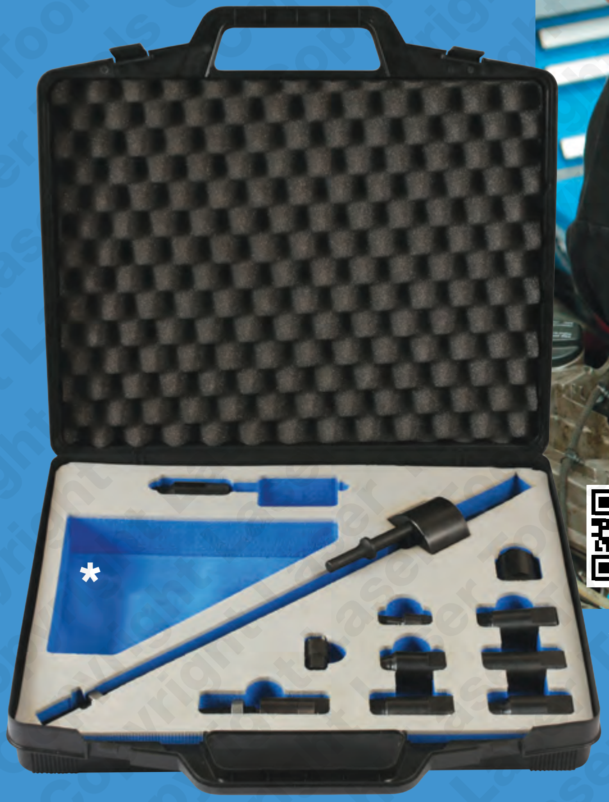
LASER®

6264

Diesel Injector Extractor with Adaptors

Instructions



* Space left to store your own Air Hammer Gun.

REGISTERED DESIGN

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This tool allows the vibration and impact delivered by an air chisel/hammer unit to be used to extract components.

Equipped with a 5/8" male thread for connection to any slide hammer adaptor with a similar internal thread.

The Tool Connection recommends the use of the **Laser 6031 Air Hammer** unit.

When combined with the appropriate adaptor this tool can be used to extract:

- Diesel injectors.
- Blind pivot pins such as articulated lorry fifth wheel pins.
- Small diameter bearings (under 30mm diameter).
- Dents in body work.

We are continually developing new designs and ideas - please check website for the very latest accessories for this tool.

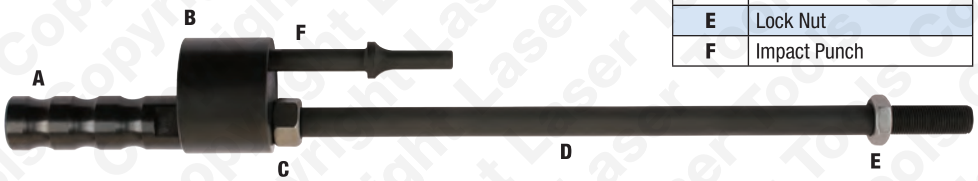
Please note:

The use of an air chisel/hammer for extraction utilises high impact and vibration levels. For this reason any component removed using this method must be properly checked and tested for functionality before being refitted.

The Tool Connection Limited can not be held responsible for damage caused by the use of this tool.

Components

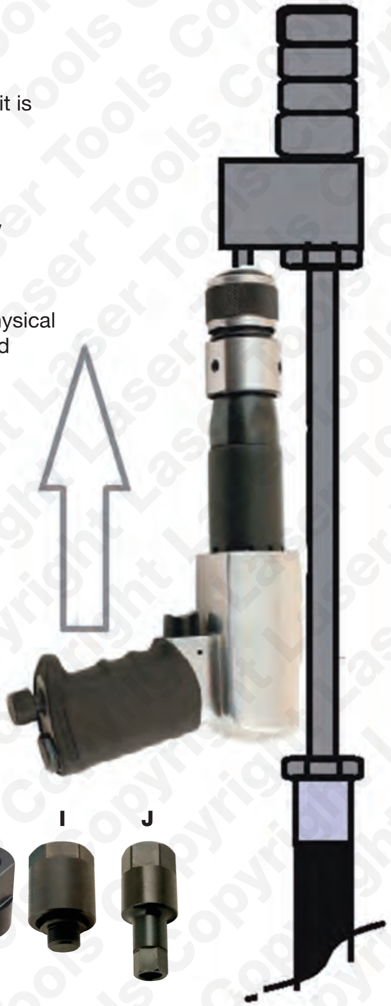
Ref	Description
A	Handle
B	Impact Boss
C	Lock Nut (mass to handle)
D	Extractor Shaft
E	Lock Nut
F	Impact Punch



Preparation and Precautions

- **All lock nuts must be kept tight when in use.**
- Ensure gloves, safety glasses and ear defenders are used during the extractions process.

Instructions for Use (Extraction)



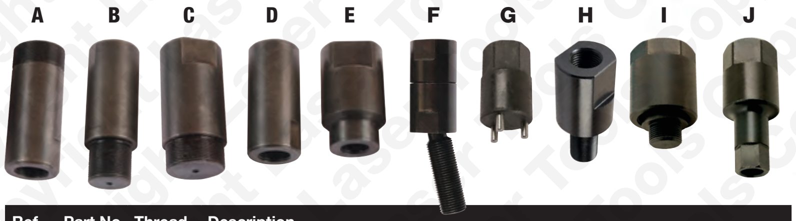
- Check the handle and lock nut (**C**) are tight.
- Fit appropriate adaptor and tighten lock nut (**E**).
- Connect to component to be removed and tighten.
- Insert the Impact Punch (**F**) into the Air Hammer and ensure it is locked in place.
- Set air hammer to a low setting where possible
- Insert Impact punch fully into the impact boss.
- Operate the air hammer for 5 second bursts starting at a low setting.
- Increase the impact and vibration level as required.
- Once the component has started to move ease off on the physical upward pressure being applied to ensure the component and extractor do not suddenly fly out.

ALWAYS HOLD THE AIR HAMMER AND EXTRACTOR COMBINATION WITH BOTH HANDS.

DO NOT USE ANY TRIGGER LOCK FACILITY.

NEVER PULL TOWARD THE FACE.

Adaptors included in this kit are:



Ref	Part No	Thread	Description
A	6118	M25	Siemens injectors with M25 thread
B	6119	M20	Denso injectors with M20 thread (Nissan etc)
C	6120	M27	Siemens injectors with M27 thread
D	6121	M12	M12 internal thread to fit older style injectors equipped with M12 high pressure pipe union on the top of the injector
E	6122	M14	Internal for Delphi
F	6123	Universal	Off line action with 15° angle 30° swing
G	6231		Valve seat remover
H	6255	M16	Denso adaptor
I	5128		Dual connector adaptor - Bosch
J	4761		Bosch Injector Dismantling Tool

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6714

LASER®

Diesel Injector Extractor

JLR 2.7/3.6 engines

Instructions

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Diesel Injector Extractor

JLR 2.7 V6
3.6 V8 CR Diesel Engines

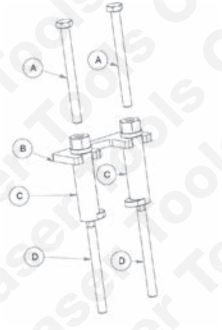
Instructions

Description
An easy to use diesel injector removal tool specifically designed to extract the common rail injectors used on the Jaguar Land Rover 2.7 TDi V6 & 3.6 TDi V8 diesel engines found across the Jaguar and Land Rover ranges.

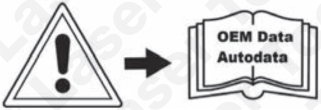
Equivalent to the OEM 303-1127

Applications
Land Rover Discovery 3, Discovery 4,
New Range Rover, Rand Rover Sport.
Jaguar X200, S Type, X250(XF), X350(XJ).

Engine codes:
2.7 = 276DT, 7G
3.6 = 368DT



Ref	OEM	Description
A	303-1127	Set Screws x2
B		Extractor Force Plate x1
C		Extractor Legs x2
D		Extractor Base Screws

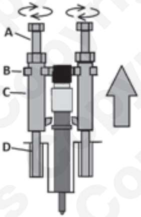


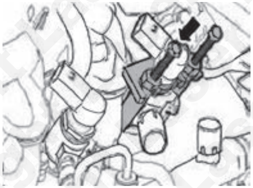
The following instructions are for guidance only. Please refer to OEM derived data such as the vehicles manufactures own data or Autodata. The use of this injector extraction tool is purely down to the user's discretion and The Tool Connection Ltd cannot be held responsible for any damage caused what so ever.

Instructions
Remove the injector pipes and holding bolts.
Screw extractor base screws **(D)** in place of injector holding bolts.
Assemble components **C, B** & **A** as shown on the extractor base screws.

NB: ensure components **C** are fully engaged in the slots on the injector.

Wind the set screws **(A)** evenly down while holding the extractor legs **(C)** from turning.





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7525_Instructions_V2

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7525

LASER®

Diesel Injector Remover

VAG TDi

Instructions

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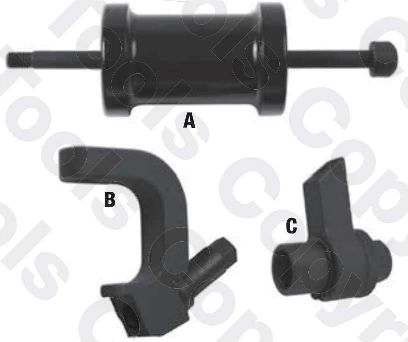
Components

This tool kit is made up of a pair of bolt-on injector adaptors and small slide hammer. It is designed to be used to help extract VAG Common Rail diesel injectors with the minimum of disassembly. The kit is equivalent to VAG OEM tools T10402 and T10415.

(No solenoid removal required).

For seized injector removal please use Laser 6263 Extractor with Air Hammer.

Note: Check OEM data to confirm application.



Ref	OEM	Description
A		Slide Hammer
B	T10402	Injector Adaptor and Fixing (piezo Injector 1.6 common rail etc.)
C	T10415	Injector Adaptor and Fixing (2.0L common Rail engines etc.)

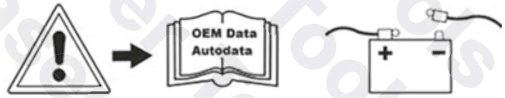
Applications

Make	Model	Year	Type
Audi	A3	2009/2013	TDi CR
Seat	Ibiza	2008	
	Altea	2009	
	Altea XL	2009	
	Altea Freetrack	2009	
	Leon	2009	
	Toledo	2013	
Volkswagen	Golf	2009	

Engine	Code
1.6	TDi CR diesel
2.0	TDi

The following instructions are for guidance only. Please refer to OEM derived data such as the vehicles manufactures own data or Autodata.

The use of this injector puller kit is purely down to the user's discretion and Tool Connection cannot be held responsible for any damage caused what so ever.

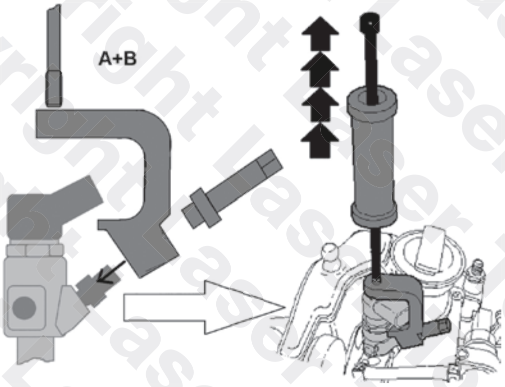


Instructions

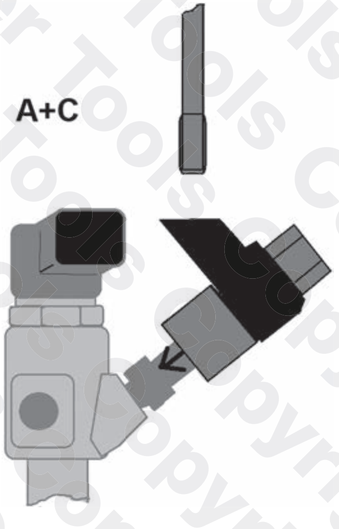
NOTE:

- Before removing injector pipes and injectors ensure the working area is clean to prevent dirt from entering the fuel system/engine cylinder.
- Block off any open pipes
- Select appropriate adaptor (B or C) according to OEM specification and assemble as shown.
  N.B: these instructions are for guidance only. The Tool Connection Ltd. Strongly advises the use of OEM instructions and applications information.

Assembly of A and B



Assembly of A and C



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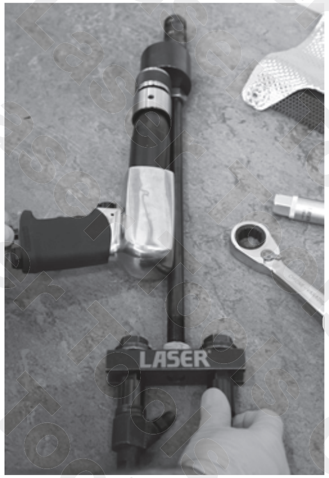
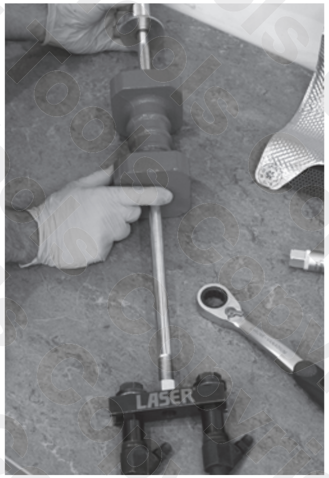
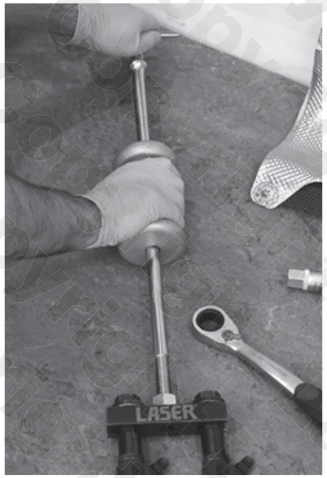

Laser Part No. **6092**
(Air Hammer Extractor)


Laser Part No. **4811**
(Slide Hammer)


Laser Part No. **5850**
(Slide Hammer)

7855_Instructions_v5

Guarantee

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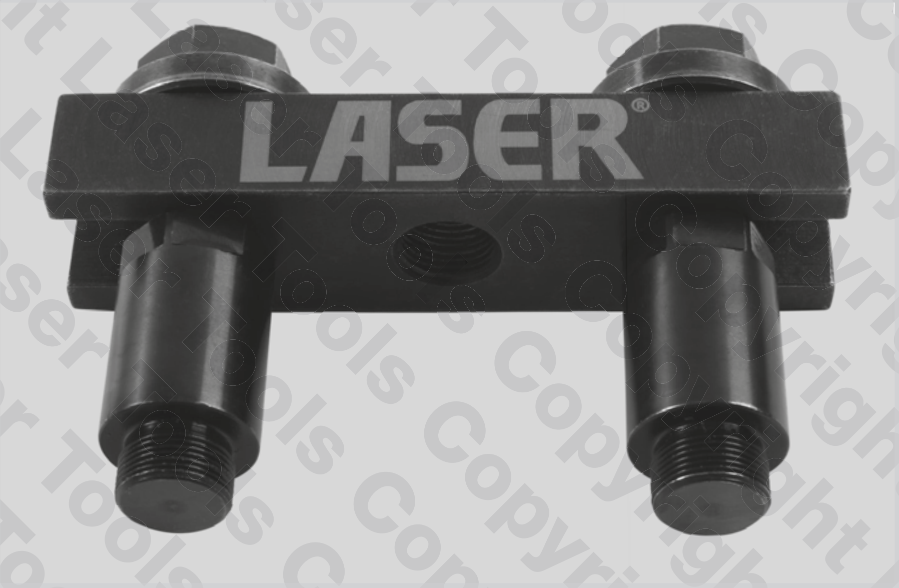
LASER®

7855

Paired Injector Puller Adaptor

Fiat, Ford, Vauxhall 1.3 JTD

MADE IN SHEFFIELD



The 7855 injector puller adaptor is designed to pull the Bosch diesel injectors used in the Fiat based 1.3 common rail engines that are found the Fiat, Alfa, Ford and Vauxhall ranges.

The injectors on these engines are held down in pairs by a centrally mounted bracket. When the bracket is removed BOTH injector will be disturbed so both should be pulled out.

The 7855 enables the user to pull these injectors in pairs or singularly if required.

N.B: Designed for use with any slide hammer equipped with a 5/8" UNF thread – available separately.

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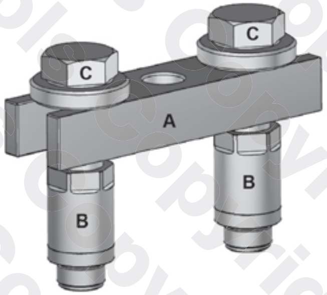
Introduction

- Manufacturers covered include: Alfa Romeo, Fiat, Ford, Lancia, Opel/Vauxhall
- Models covered include: Alfa Romeo Mito, Fiat 500, Doblo, Fiorino, Punto, Idea, Panda, Quobo, Tipo, Uno, Ford Ka, Opel/Vauxhall Agila, Astra, Combo, Corsa, Meriva, Tigra, and Zafira.
- Engine Applications include: 1.3 common rail diesel (JTD) engines equipped with paired Bosch solenoid type injectors.
- Suitable for use with Air Hammer Extractor, Laser Part No. 6092 or Slider Hammers, Laser Part Nos. 5850 (2.2kg) and 4811 (4.4kg)
- To attach the 7855, additional tooling is required to remove the solenoid internals, see Laser Part No. 4761.

Components

Ref:	Description
A	Injector Extractor Bridge
B	Injector screw in adaptor x 2
C	Top Bolt x 2



Make, Model, Year		
Alfa Romeo	MiTo	2008 to 2018
Fiat	500/500C	2007 to 2018
	Doblo	2004 to 2018
	Fiorino	1982 to 2018
	Grande Punto	2005 to 2012
	Idea	2004 to 2012
	Linea	2007 to 2016
	Panda	1986 to 2018
	Punto	2003 to 2016
	Qubo	2008 to 2018
	Strada Pick-up	2006 to 2016
	Tipo	2015 to 2018
	Uno	1982 to 1991
Ford	Ka	2008 to 2015
Lancia	Musa	2004 to 2013
	Ypsilon	2003 to 2015
Opel/Vauxhall	Agila	2003 to 2010
	Astra-H	2004 to 2015
	Combo-C/D	2003 to 2016
	Corsa-C/D/E	2003 to 2018
	Meriva-A/B	2003 to 2010
	Tigra-B	2004 to 2010
	Zafira-B	2006 to 2010

Engine Codes	
1.3	
127A5.000	330A1.000
146B1.000	55266963
156A5.000	843A2.000
169A1.000	955B2.000
169A1.000 (FD4) / BAAA/B	A13DTC
169A5.000	A13DTE
188A8.000	A13DTR
188A9.000	BBAB
199A2.000	D13A
199A3.000	LDV/A13DTC
199A9.000	LKU/B13DTE
199B1.000	LKU/B13DTR
199B2.000	LKV/B13DTC
199B4.000	LN9/A13DT (263A2.000)
199B8.000	LSF/A13DTC
223A9.000	LSF/A13DTE
225A2.000	Y13DT
263A2.000	Z13DT
263A6.000	Z13DTE
312A8.000	Z13DTH
312B1.000	Z13DTI
312B2.000	Z13DTJ
	Z13DTR

The following instructions are for guidance only. Please refer to OEM derived data such as the vehicles manufactures own data or Autodata.

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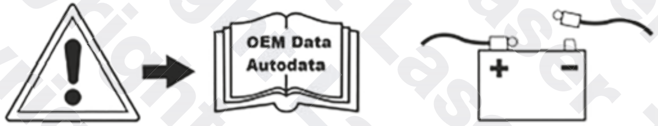


Instructions

NOTE: Refer to vehicle manufacturer's instructions for vehicle/engine specific data.

Thoroughly clean the area around the injector to be removed. Soak the injector body in release agent and mark the alignment of the injector on the cylinder head to ensure the injector fits back in to the correct position.

EXTRACTION: PULLING TWO INJECTORS:

1. Remove the injector holding bolt and remove the solenoid tops and solenoid internals using a suitable socket and hex key (see Laser 4761 available separately).
2. Screw in the injector adaptors (B) as shown in figure 1 and tighten down.
3. Position the injector extraction bridge (A) and attach using the 2 top bolts (C) as shown in figure 2.
4. Attached a suitable slide hammer and extract the injectors.

Fig:1

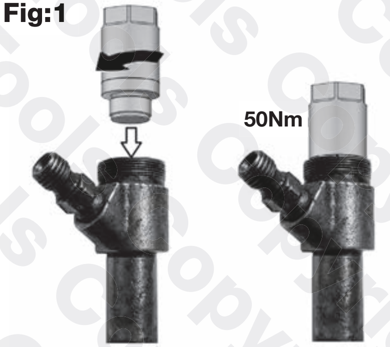
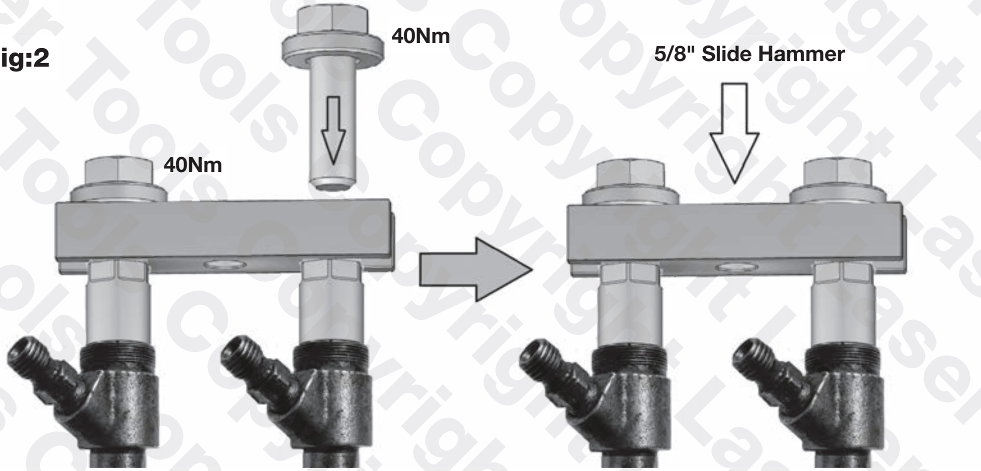


Fig:2

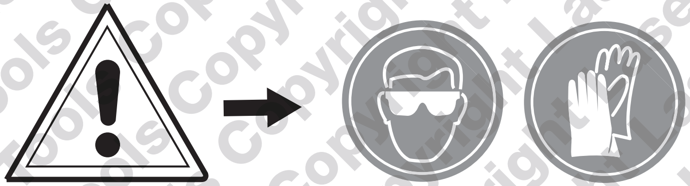


EXTRACTION: PULLING ONE INJECTORS:

To extract just one injector simply attach the slide hammer directly to the injector adaptor (B).

Safety Warnings - please read

- Wear hand and eye protection when using this tool kit.
- Always carefully clean the tool components after each use.
- Keep the tool components safe and tidy in the supplied case.
- Do not use the kit for any purpose other than for which it is designed.



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7912_Instructions_V2

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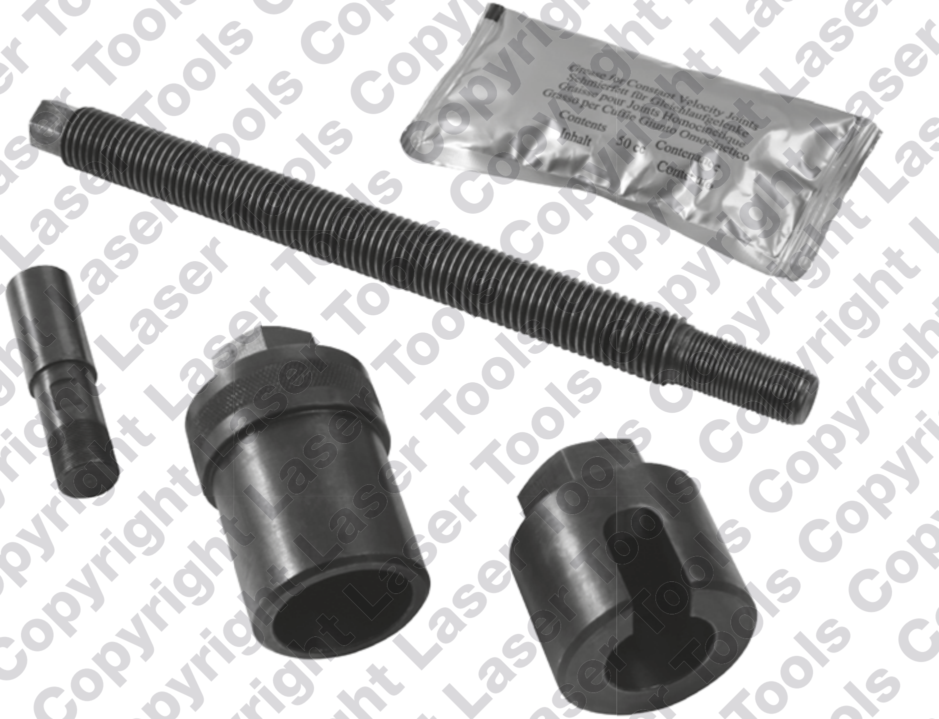
Part No. 7912

LASER®

Injector Extraction Kit
Ford EcoBlue 2.0L Diesel

MADE IN SHEFFIELD

Instructions



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Introduction

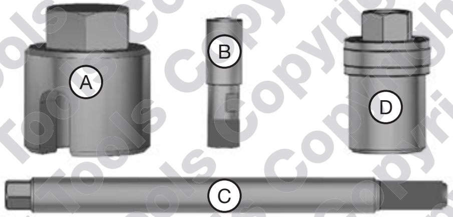
The 7912 has been designed to extract seized injectors from the Ford 2.0lt EcoBlue Diesel engines in the method described by Ford. Injector removal is required for any service or repair work that requires the removal of the cam cover, cylinder head or camshafts.

NOTE: Beware, This Method is for seized injectors only and will render the injector unserviceable.

- Applications include: Ford Edge, Focus, Galaxy, Ranger, S-Max, Tourneo and Transit fitted with the EcoBlue 2.olt Diesel engines from approximately 2016.
- Equivalent to OEM tools 303-1690, 303-1690/1 & 303-1690/2.
- For removal of injector lower seal see Laser 5450 or Laser 4702.
- For injector port cleaning please see Laser 6101 and laser 4597.
- **NOTE:** this kit uses a force screw. Please ensure Molybdenum Disulphide grease is used to lubricate the force screw before use.

Components

Ref.	Description
A	Injector Top Removal Socket
B	Injector Bottom Adaptor
C	Extractor Force Screw
D	Extractor Force Nut/Bearing Assembly



The following instructions are for guidance only. Please refer to OEM derived data such as the vehicle manufacturers own data or Autodata.
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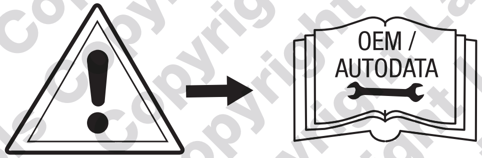


Instructions

NOTE: the following process has been devised for the removal of seized injector where removal without damge to the injectors is impossible. Use of the 7912 injector extractor will render the injector unserveable.

Preparation:

1. Remove injector fuel feed (a) and return (b) pipes as shown in figure 1.
2. Remove the injector holding bracket (d) shown in figure 1.
3. Thoroughly clean the area around the injector and soak in release agent – leave to soak.
4. Break off the injector fuel return spigot (e) and the electrical connection (f) as shown in figure 2.
5. Fit the injector top removal socket (A) over the top of the injector and using a suitable socket and knuckle bar remove the injector top by turning anti-clockwise as shown in figure 3.
6. Thoroughly clean out the injector aperture and remove any loose internal components in the injector bottom. Soak in release agent.
7. Screw the injector bottom adaptor (B) onto the end of the force screw (C) and then screw the assembly in to the injector bottom (6 turns minimum). Ensure the assembly screws in fully. See figure 4.
8. Lubricate the force screw with Molybdenum Disulphide grease and screw the force nut and bearing assembly onto the force screw. Wind the force nut down until the assembly sits on the cylinder head.

   Continue winding the force nut to pull the injector out as shown in figure 5.
9. Remove the injector lower copper seal using Laser 5450 or 4702 (available separately).

NOTE: for best results where possible:

- Work with the engine warm.
- Ensure the injectors are soaked in release agent. The longer the injectors are left to soak the easier extraction will be.

FIG 1

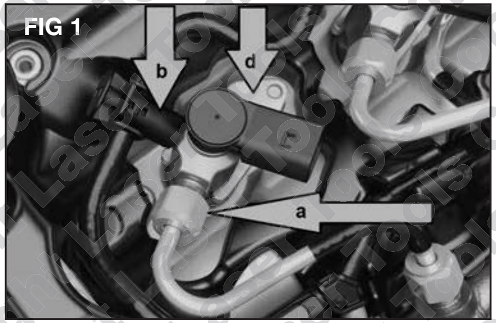
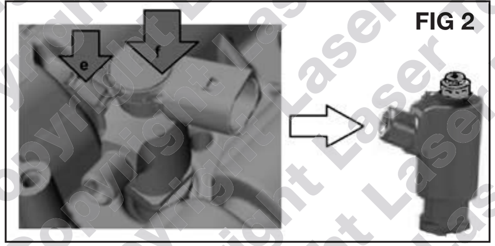


FIG 2



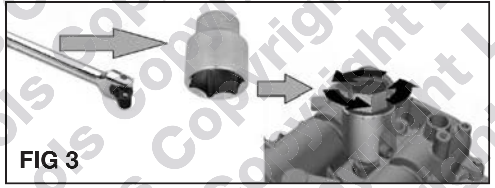


FIG 3

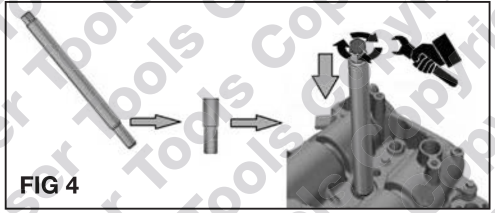


FIG 4

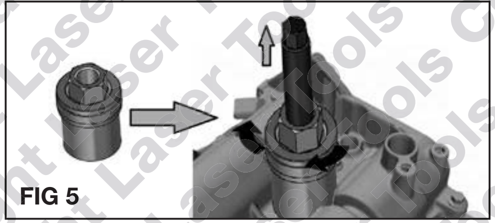


FIG 5

Part No. 7958

LASER®

Torque Multiplier Adaptor

Ford Ecoblue 2.0 Diesel

Instructions

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Introduction

The Ford 2.0lt EcoBlue Bi-Turbo Diesel engines used across the Ford range from 2016 on use stretch bolts to attach the cylinder head which require the use of a torque multiplier.

The Laser 7958 Torque Multiplier Adaptor has been specifically design to allow the Laser 7318 torque multiplier to be used to tighten the head bolts correctly.

NOTE: removal of the cylinder head on the EcoBlue 2.0lt diesel requires removal of the injectors and cam carrier. For removal of stuck injectors use Laser 7912 Injector Extraction Kit – Ford EcoBlue 2.0lt Diesel.

- For use with Laser 7318 torque multiplier only.
- Allows correct application of torque and angle to the EcoBlue 2.0lt head bolts. Includes 17mm Hex and M12 Ribe impact sockets.
- Applications include: Ford Focus (from 2018), Galaxy (from 2018), Ranger (from 2019), SMAX (from 2018), Tourneo Custom (from 2016), Transit (from 2016), Transit Custom (from 2016), Edge (from 2015), Kuga (from 2019).
- Engines: All 2.0lt EcoBlue Diesel engines.
- Equivalent to OEM 303-1611-03 (use with Laser 7318 torque multiplier only).

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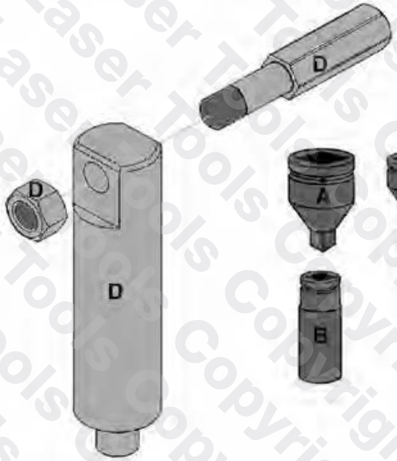
Components



Ref.	Description	
A	303-1611-03/4	Impact ¾" to ½" drive Adaptor
B		17mm Deep Impact Socket
C	422 1140 001 00	M12 RIBE Impact Socket
D	303-1611-03/1	Torque Multiplier Reaction Tool

The following instructions are for guidance only. Please refer to OEM derived data such as the vehicles manufacturers own data or Autodata.

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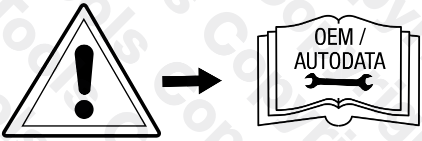

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Instructions

Make, Model Year			Engine Codes
Ford	Focus	From 2018	**2.0L** BC2X BCCA BCCB BCCC BCCD BJFA BJFB BJFC BJFC BJRA BJRB BKFA BKFB BKFC BKFD BKRA BKRB BLFA BLFB BLFC YLCC YLDA YLF6 YLFA YLFB YLFS YLR6 YLRA YMCA YMCB YMCC YMF6 YMFA YMFB YMFS YMHA YMR6 YMRA YN2X YNCA YNF6 YNFA YNFB YNFS YNR6 YNRA
	Galaxy	From 2018	
	Ranger	From 2019	
	S-Max	From 2018	
	Transit Custom	From 2016	
	Transit	From 2016	

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Instructions

Tightening Cylinder Head Bolts:

Preparation:

- In order to access the head bolts the injectors and cam carrier must be removed.
- New bolts must be fitted. The bolts used are stretch bolts that require the torque multiplier to fit.
- Ensure the injector apertures are clean and free from debris.

NOTE: use 7958 is designed for use with Laser 7318 torque multiplier only.

Instructions

The Ford OEM torque procedure must be followed. The following is provided as an example only please check vehicle specific OEM data.

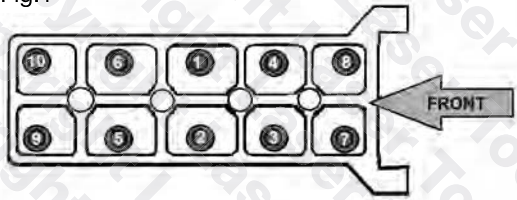
1. Using a suitable torque wrench tighten all the bolts as follows in the order shown in **figure 1**.

- 15 Nm all bolts.
- 25 Nm all bolts
- 40 Nm all bolts

NOTE: Mark each bolt with a suitable marker pen so the angle turned is easy to see.

- 90° = 90° at the bolt. All bolts.
- 90° = 90° at the bolt. All bolts

Fig.1



Due to the force required the next 2 stages must be done using the 7958 and 3718 combination described on the next page.

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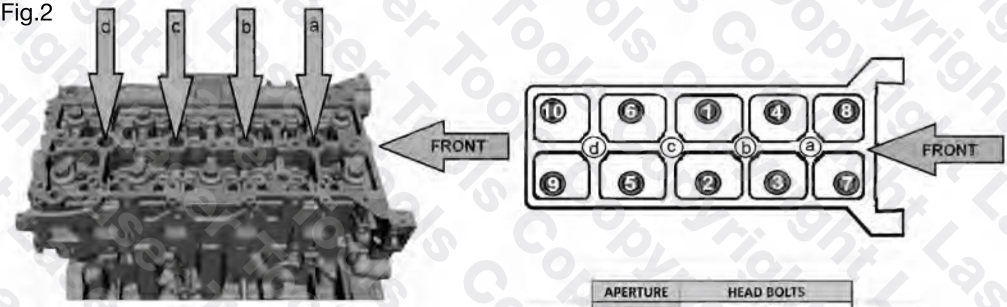
Instructions

Fig.2



APERTURE	HEAD BOLTS
a	1 & 2
c	3 & 4
b	5 & 6, 7 & 8
c	9 & 10

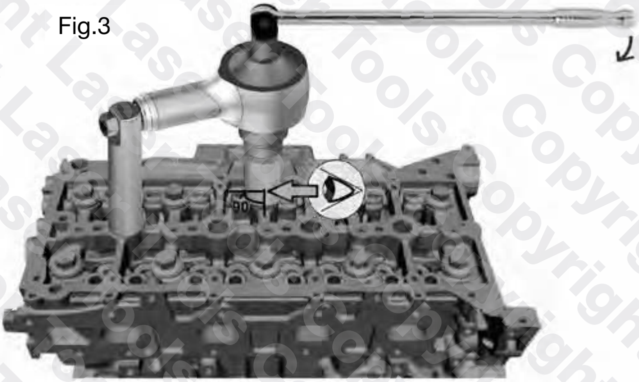
2. The 7958 adaptor is designed to be attached to the engine by inserting the lower end of the vertical shaft in to one of the injector apertures (marked **A** to **D** in **figure 2**).

The Table in **figure 2** shows which head bolt can be tightened from each aperture.

3. Assemble the 7958 and 3718 using the drive adaptor (**A**) in combination with the socket (**B**) or Ribe socket (**C**) as required as shown in **figure 3**. Tighten all the bolts 2 more stages of 90 degrees each (at the bolt) using a suitable knuckle bar as shown in the order shown in **Figure 2**.

- 90° = 90 at the bolt. All bolts.
- 90° = 90 at the bolt. All bolts

Fig.3



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It is our policy to continually improve our products and thus we reserve the right to alter specifications and components without prior notice. It is the responsibility of the user to ensure the suitability of the tools and information prior to their use.

Safety First. Be Protected.

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INSTRUCTIONS FOR:

DIESEL INJECTOR PULLER CITROEN / PEUGEOT

MODEL No: **VS2005**

Thank you for purchasing a Sealey product. Manufactured to a high standard this product will, if used according to these instructions and properly maintained, give you years of trouble free performance.

⚠ ***IMPORTANT:*** **PLEASE READ THESE INSTRUCTIONS CAREFULLY. NOTE THE SAFE OPERATIONAL REQUIREMENTS, WARNINGS AND CAUTIONS. USE THE PRODUCT CORRECTLY AND WITH CARE FOR THE PURPOSE FOR WHICH IT IS INTENDED. FAILURE TO DO SO MAY CAUSE DAMAGE AND/OR PERSONAL INJURY AND WILL INVALIDATE THE WARRANTY. PLEASE KEEP INSTRUCTIONS SAFE FOR FUTURE USE.**

1. SAFETY INSTRUCTIONS

❐ **WARNING!** *Ensure Health and Safety, local authority and general workshop practice regulations are adhered to when using tools.*

❐ **WARNING! Always use caution when working around fuel systems. The fuel in the fuel rail may be pressurised even if the engine is not running.**

❐ ***IMPORTANT:*** *These instructions are provided as a guide only. Always refer to the vehicle manufacturer's service instructions, or a proprietary manual, to establish the current procedure and data, also any warnings or cautions particular to the vehicle.*

✗ **DO NOT** use the set if any parts are missing or damaged.

✗ **DO NOT** use this tool for any purpose other than that for which it is designed.

✓ Switch off vehicle's ignition and disconnect the battery before commencing work under the bonnet.

✓ You must follow the vehicle's service manual cautions when working around the air bag system. If the cautions are not followed the air bag may deploy unexpectedly even after the ignition is turned 'OFF', resulting in personal injury.

✗ Never lay tools on the vehicle's battery. This may short the terminals together, causing harm to yourself, the tools, or the battery.

✓ Operate in a well ventilated area. Do not inhale fuel vapours.

✓ Wear approved eye protection. A full range of personal safety equipment is available from your Sealey dealer.

✓ Wear suitable clothing to avoid snagging. Do not wear jewellery and tie back long hair.

✓ Keep children and other unauthorised persons away from the working area.

✓ Keep yourself, tools, and test equipment away from hot engine parts.

✓ Always keep a fire extinguisher close by, that is suitable for fuel/ electrical/chemical fires.

✗ **NEVER** smoke or have open flames near vehicle.

✓ Always relieve fuel pressure before disconnecting fuel lines from injectors.

✓ Use a rag to cover fuel line fittings, when connecting or disconnecting fuel lines. Avoid contact with fuel.

✓ Clean up all fuel spills immediately and dispose of all rags properly.

✓ Maintain the tool components in good and clean condition for best and safest performance.

✓ When work on the vehicle is finished, ensure all connections on vehicle are restored, and that there are no tools left in the engine bay.

✓ Replace tools in the carrying case and store in a safe, dry, childproof location.

2. INTRODUCTION & CONTENTS

Comprehensive set for removing Citroen/Peugeot 2.0/2.2HDi 16v fuel injectors. Allows the removal of seized injectors without the need to remove the cylinder head. Bridge fits perfectly on the cylinder head preventing damage to the area surrounding the injector. Supplied in carry-case.

Contents: (refer to fig.1)

Item	**Description**
1	Bridge
2	3 x Bridge Legs
3	2 x Force Screws - Thread 17mm, 25mm x Pitch 1mm
4	Force Screw Nut
5	Injector Sockets 25mm, 29mm
6	Security Hex Key - ½"sq. drive

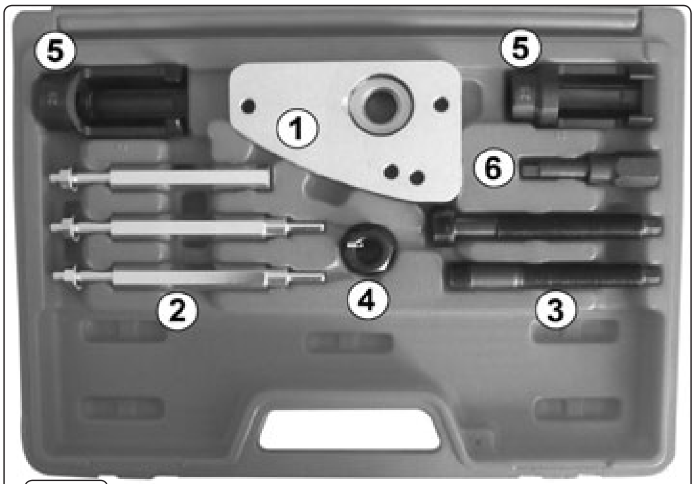


fig.1

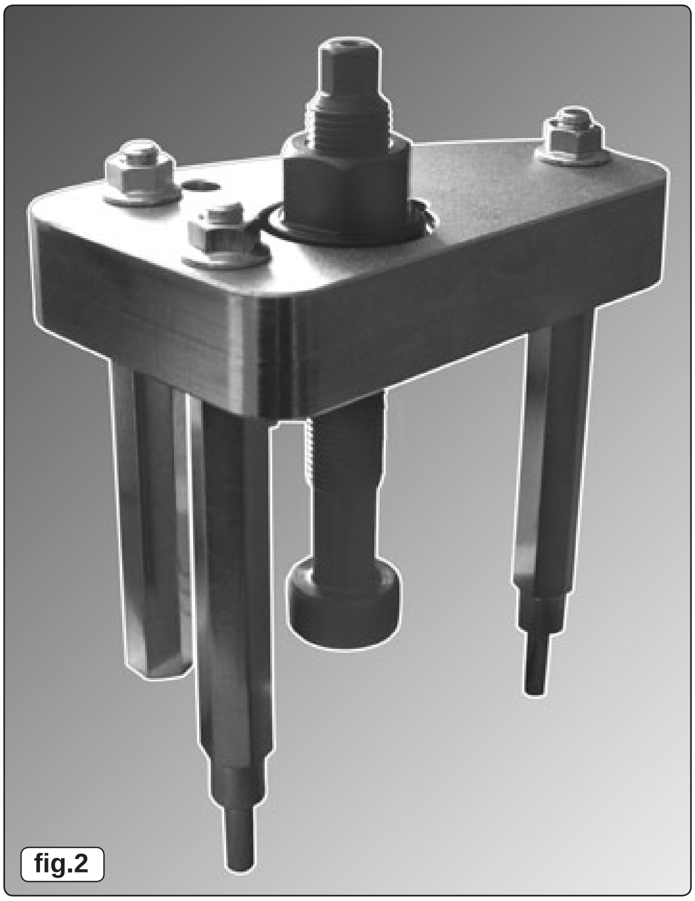


fig.2

3. ASSEMBLY

3.1. Referring to the individual components in fig.1. assemble the Injector Puller minus the force screw as shown in fig.2. overleaf. a different configuration of the bridge legs may be needed depending on engine.

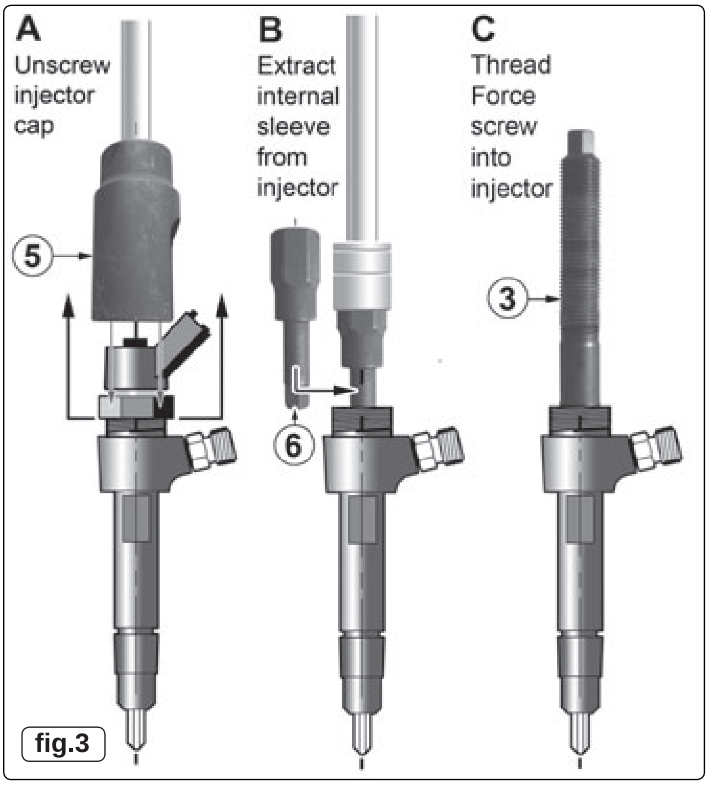

A
Unscrew injector cap
5
B
Extract internal sleeve from injector
6
C
Thread Force screw into injector
3

fig.3

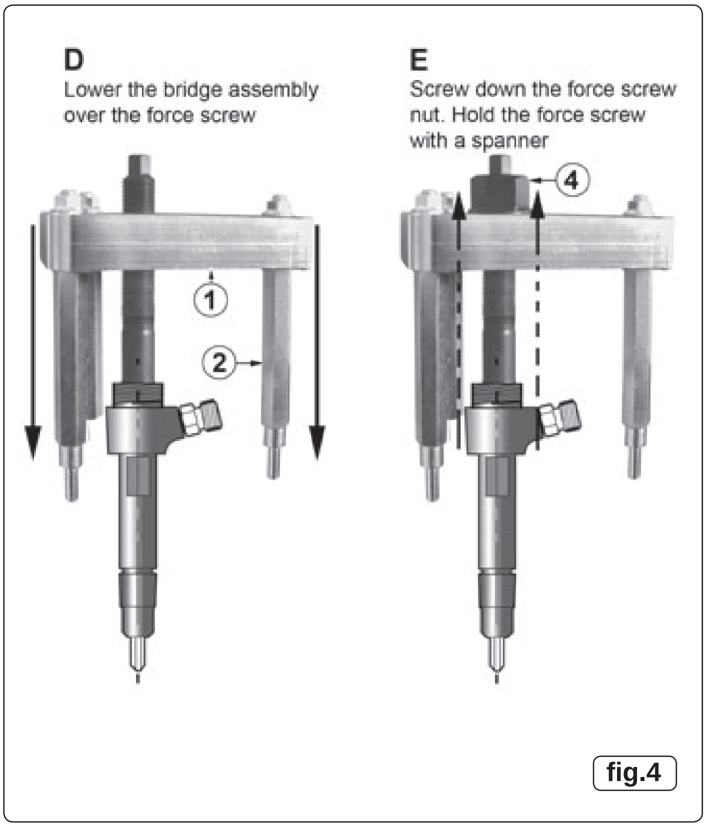

D
Lower the bridge assembly over the force screw
1
2
E
Screw down the force screw nut. Hold the force screw with a spanner
4

fig.4

4. OPERATION

4.1. Before working on the fuel system, make sure that the fuel system is **NOT** pressurised. Refer to the manufacturer's instruction manual on how to de-pressurise the system.

4.1.1. Disconnect the injector wires and connections as per the manufacturer's instructions.

4.1.2. Remove any carbon build up from around the injector.

4.1.3. Remove the cap from the injector using the appropriate size socket (fig.3A).

4.2. Removing Inner Sleeve. (fig.3).

4.2.1. Remove the internal parts from the injector to gain access to use the security hex key (fig.3.6). It may be necessary to remove the injector veins by force. Insert the security hex into the inner sleeve. Turn the security hex anti-clockwise using a 21mm socket to remove the inner sleeve (fig.3B).

4.2.2. Select the appropriate force screw and screw into the threads of the injector and tighten with a suitable spanner (fig.3C).

4.3. Removing the injector. (fig.4).
It will be necessary to remove the engine cam cover and possibly a manifold bolt, please refer to the manufacturer's manual for instruction. The removal of certain bolts from the engine will allow suitable space and support for the bridge legs to use.

4.3.1. Slide the bridge assembly over the force screw, inserting the legs into the appropriate holes for a sturdy footing (fig.4D).

Note: One leg is flat and is to be used on the top of the cylinder head and not to be inserted into a bolt hole.

4.3.2. Screw the force screw nut onto the force screw until finger tight.

4.3.3. Using appropriately sized spanners, hold the force screw securely with one spanner, and tighten the nut with the other, the injector should gradually slide out.

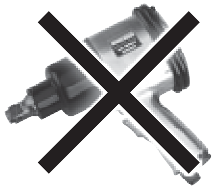
Note: An approximate force of NO MORE THAN 150Nm should be applied to the nut, and a socket should NOT be used.
Whilst applying force, constantly check the seating of the tool and ensure that there is no twisting of the bridge assembly.

4.3.4. If the injector cannot be removed, it may be necessary to use a suitable penetrating oil and leave for a period of time, before applying force again. If the injector still cannot be removed, consult a main dealer or a diesel specialist, to avoid damage to the engine.

4.3.5. When an injector has been removed, it is recommended that only a new or refurbished injector is fitted. Follow the manufacturer's fitting and safety instructions.

ALWAYS KEEP FORCE SCREW WELL LUBRICATED.

DO NOT USE AIR TOOLS, IMPACT WRENCHES, BREAKER BARS OR SOCKETS



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INSTRUCTIONS FOR:

DIESEL INJECTION LEAK BACK KITS

MODEL No's: **VS2046.V2, VS2047.V2, VS2048.V2**

Thank you for purchasing a Sealey product. Manufactured to a high standard this product will, if used according to these instructions and properly maintained, give you years of trouble free performance.

IMPORTANT: **PLEASE READ THESE INSTRUCTIONS CAREFULLY. NOTE THE SAFE OPERATIONAL REQUIREMENTS, WARNINGS AND CAUTIONS. USE THE PRODUCT CORRECTLY AND WITH CARE FOR THE PURPOSE FOR WHICH IT IS INTENDED. FAILURE TO DO SO MAY CAUSE DAMAGE AND/OR PERSONAL INJURY AND WILL INVALIDATE THE WARRANTY. PLEASE KEEP INSTRUCTIONS SAFE FOR FUTURE USE.**

1. SAFETY INSTRUCTIONS

❐ **WARNING! Ensure all Health and Safety, local authority, and general workshop practice regulations are strictly adhered to when using this kit.**
✓ Maintain tools in a good clean condition for the best and safest performance,
✗ **DO NOT** use test kit if parts are damaged.
✓ Wear approved eye protection. A full range of personal safety equipment is available from your Sealey dealer.
✓ Wear suitable clothing to avoid snagging. Do not wear jewellery and tie back long hair.
❐ **WARNING!** In a vehicle fitted with automatic transmission, select neutral or park.
✓ Use proper ventilation and avoid breathing in exhaust fumes.
✓ Keep a fire extinguisher to hand.
✓ Protect hands from burns, as the engine will be hot after the test.
✓ Account for all tools and parts being used, and do not leave them in, or on the engine after use.
✓ Ensure that any collected diesel is disposed of correctly, in accordance with local authority guidelines.
✗ **DO NOT** leave vehicle's engine running unattended whilst the testing kit is fitted.

IMPORTANT: *Always refer to the vehicle manufacturer's service instructions, or a proprietary manual to establish the current procedure and data. These instructions for use are provided as a guide only.*

VS2048.V2

VS2047.V2

VS2046.V2

2. INTRODUCTION

Designed to measure return fuel flow on diesel vehicles with up to 6 cylinders and fitted with common rail injection system. Identifies worn, blocked or inoperative injectors, quickly and easily. The VS2048.V2 Master kit contains measurement tubes for short term tests and measurement bottles for long term, more accurate evaluation. Includes range of adaptors to suit Bosch, Delphi and Denso injectors, for comprehensive coverage of common rail diesel vehicles. The VS2046.V2 kit comprises measurement tubes and measurement bottles (for Bosch injectors). The VS2047.V2 comprises adaptors for Bosch, Delphi and Denso injectors.

3. OPERATION

3.1. Most modern diesel vehicles are fitted with a sound deadening cowling over the top of the engine. If fitted, remove this cowling to gain access to the engine.
3.2. **Direct Connection Tubes (Bosch connectors only - see fig.1.5).**
These tubes are ideal for a vehicle which will not start, and provide a very quick assessment.
3.2.1. The return pipes are retained by wire clips, remove the clips and store in a safe place. Gently ease out each of the return pipes from the injectors (fig.2). Take care not to break the connectors as they can be brittle.
3.2.2. Plug the ends of the return pipes to avoid any spillage.
3.2.3. Connect the tubes to each injector (fig.3), the wire clips are not required as the return system is low pressure.
3.2.4. Crank over the engine until the tubes are at least 50% full. Take care, that should the engine start, the tubes will fill up very quickly.
3.2.5. Check the levels for each injector. The overall variation in the levels should be less than 10%. Any injector which has a back leakage problem will have more diesel in the tube.
3.2.6. Remove the tubes from the injectors, taking care not to spill any diesel, place a finger over the end of the tube to hold the liquid in the tube and then empty into a suitable container.
3.2.7. Refit the return pipes to the injectors and secure them with the wire clips as per the vehicle manufacturer's workshop manual.

3.3. **Flexible Tube, Adaptors and Bottles (fig.1.1, 2, 3, 4 and 6).**
These will provide a more accurate reading as the engine can be left running for longer.

3.3.1. Remove the return pipes from the injectors. Refer to the appropriate vehicle manufacturer's workshop manual.
3.3.2. Connect the appropriate, Bosch, Delphi or Denso adaptors to the flexible tubes.
3.3.3. Connect the flexible tubes to each injector and hang the bottle rack in a suitable position.
3.3.4. Start the engine (or crank over if it will not run), run until the one of the bottles is approximately 75% full, and stop the engine.
3.3.5. Check the levels for each injector. The overall variation in the levels should be less than 10%. Any injector which has a back leakage problem will have more diesel in the tube.
3.3.6. Remove the tubes from the injectors, taking care not to spill any diesel, if possible lower the bottle rack to a level below that of the injectors or raise the flexible tube, so that the fluid in the tubes drains into the bottles.
3.3.7. Refit the return pipes to the injectors as per the vehicle manufacturer's workshop manual.

NOTE: This system is designed to give a quick assessment of the return flow of the injectors, it is unable to determine all of the factors which may affect the operation of the vehicle.

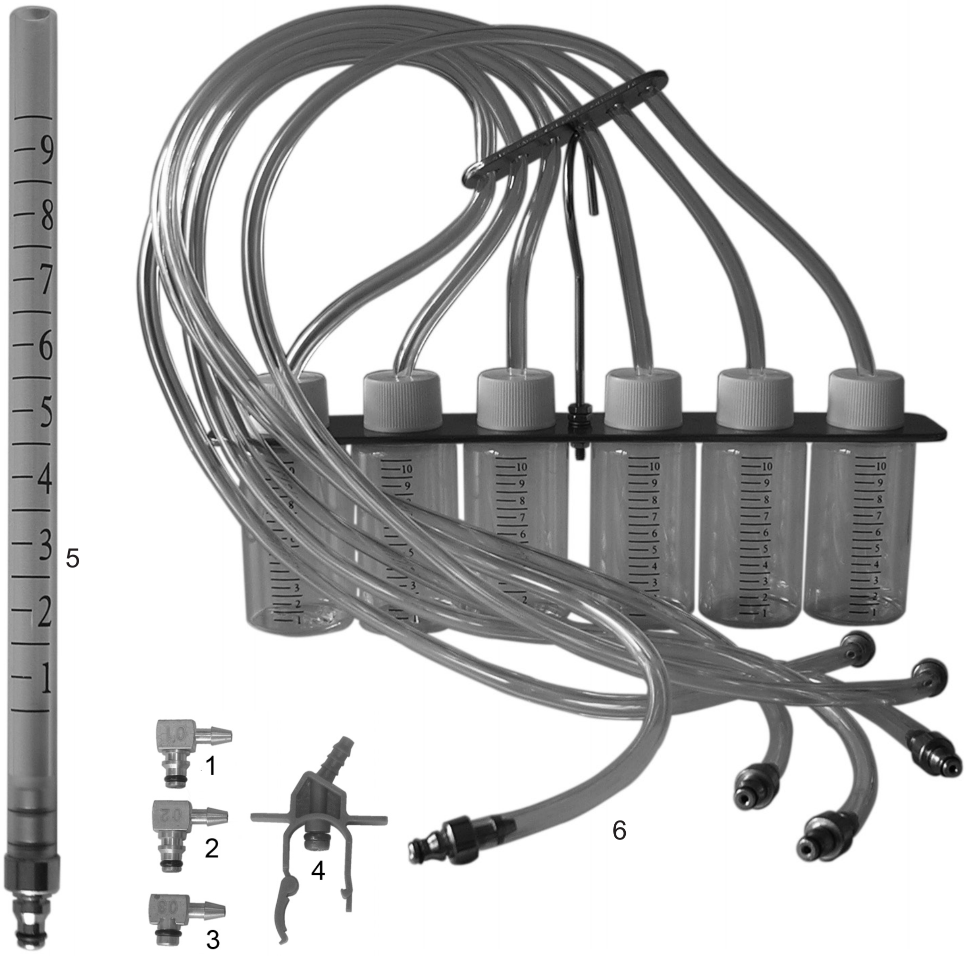

fig.1

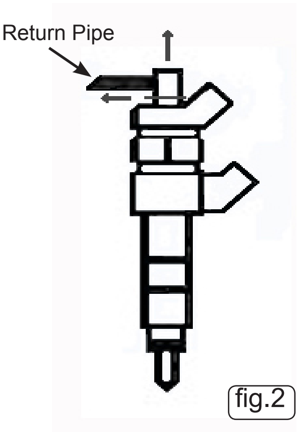

fig.2

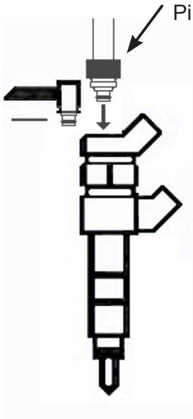

fig.3

4. PARTS

Part	Part No.	Description	
1	VS2048.V2-01	Adaptor Set 1 (supplied as single pieces)	(parts 1 to 4 are included in VS2047.V2 kit)
2	VS2048.V2-02	Adaptor Set 2 (supplied as single pieces)	
3	VS2048.V2-03	Adaptor Set 3 (supplied as single pieces)	
4	VS2048.V2-04	Adaptor Set 4 (supplied as single pieces)	
5	VS2048.V2-05	Fluid Measure (supplied as single pieces)	(parts 5 and 6 are included in VS2046.V2 kit)
6	VS2048.V2-06	Bottle / Tube / Adaptor Assembly	

NOTE: *It is our policy to continually improve products and as such we reserve the right to alter data, specifications and component parts without prior notice.*
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Original Language Version

INSTRUCTIONS FOR:

BOSCH / DELPHI DIESEL INJECTOR PULLER

MODEL NO: **VS2049**

Thank you for purchasing a Sealey product. Manufactured to a high standard this product will, if used according to these instructions and properly maintained, give you years of trouble free performance.

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1. SAFETY INSTRUCTIONS

❒ **WARNING!** Ensure Health and Safety, local authority and general workshop practice regulations are adhered to when using tools.
✗ **DO NOT** use the kit if any parts are missing or damaged.
✗ **DO NOT** use this tool for any purpose other than that for which it is designed.
✓ Switch off vehicle ignition and disconnect the battery before working under the bonnet.
✓ When work on the vehicle is finished ensure that there are no tools left under the bonnet.
✓ Maintain the tool components in good and clean condition for best and safest performance.
✓ Wear approved eye protection. A full range of personal safety equipment is available from your Sealey dealer.
✓ Wear suitable clothing to avoid snagging. Do not wear jewellery and tie back long hair.
✓ Keep children and other unauthorised persons away from the working area.
✓ Ensure there is adequate lighting prior to using this tool.
IMPORTANT: Always refer to the vehicle manufacturer's service instructions, or proprietary manual, to establish the current procedures and data.

2. INTRODUCTION & SPECIFICATION

Suitable for the removal of stubborn Bosch/Delphi diesel injectors. Set includes two adaptors for different removal methods. The first screws onto the injector cap and the second locates internally inside the injector allowing for extra force to be used. Features a flexible joint allowing the slide hammer to be used in restricted areas. Supplied with instructions in carry-case.

Contents: 1.8kg Slide Hammer, Flexible Joint, 2 x Adaptors, Security Hex Key 10mm, Injector Cap Socket.
Adaptor Thread Sizes:
Ø17mm Male x 1mm Pitch, Ø28mm Female x 1mm Pitch.

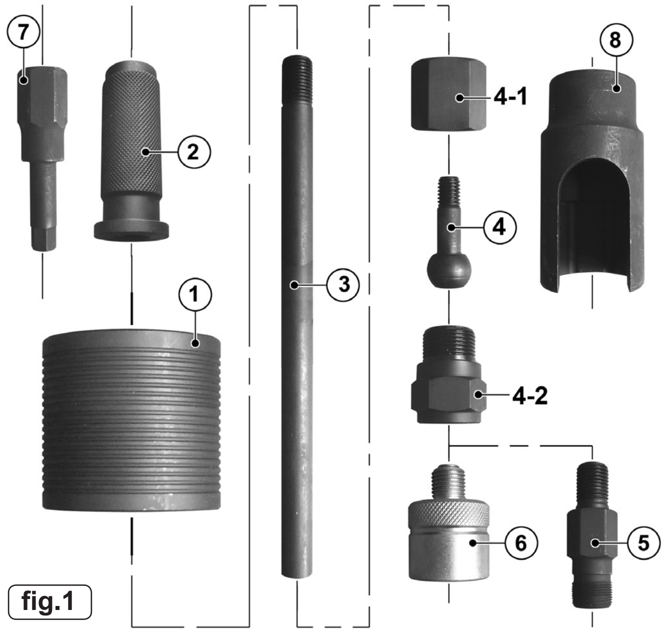
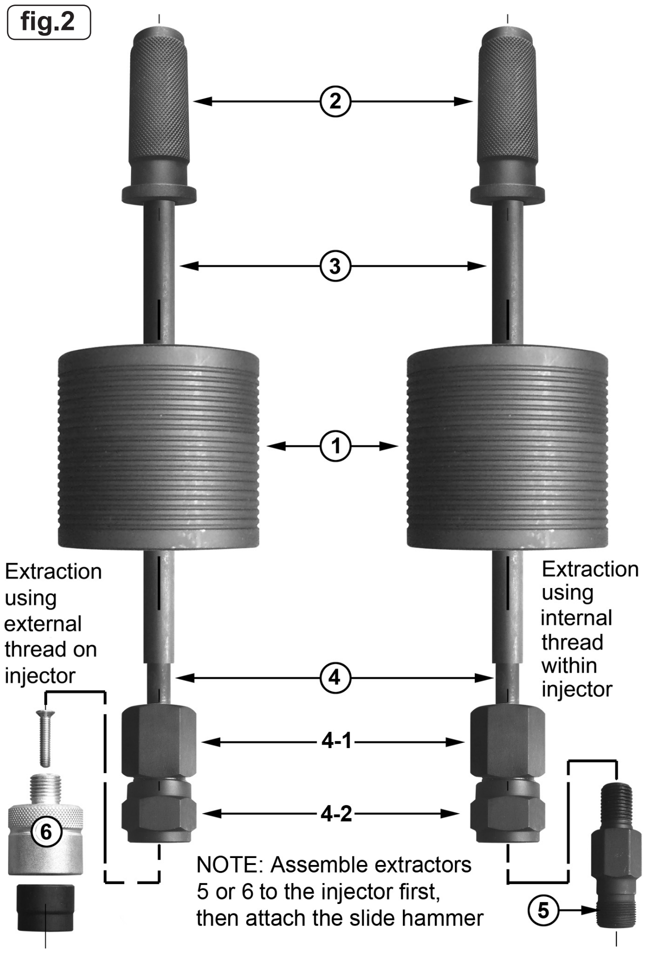


fig.1

3. PARTS/CONTENTS

Item	Part No:	Description
1	VS2049.01	Sliding hammer
2	VS2049.02	Handle (Length 73mm)
3	VS2049.03	Spindle Length 220mm)
4	VS2049.04	Ball type adaptor
	VS2049.04-1	Hex nut
	VS2049.04-2	Hex nut (male type)
5	VS2049.05	Adaptor (M17, Injector internal thread)
6	VS2049.06	Adaptor (M27,Injector external thread)
7	VS2049.07	Hex key M10 + M19
8	VS2049.08	M29 Socket with cut out (1/2" drive)

fig.2



Extraction using external thread on injector

Extraction using internal thread within injector

NOTE: Assemble extractors 5 or 6 to the injector first, then attach the slide hammer

4. ASSEMBLY

4.1 Referring to the individual components in fig.1 assemble the Injector Puller as shown above in fig.2.
4.1.1 Use adaptor 6 when the injector is being extracted using the external thread revealed when the injector cap has been removed.
4.1.2 Use adaptor 7 when the injector is being extracted using the internal thread revealed when the inner sleeve has been removed from the injector.

5. OPERATION

NOTE: Always use the external adaptor first. If by using reasonable force the injector cannot be removed, use the internal adaptor.

5.1 Before working on the fuel system, make sure that the fuel system is NOT pressurised. Refer to the manufacturers instruction manual on how to check this.

5.1.1 Disconnect the injector wires as per the manufacturers instructions.

5.1.2 Remove any carbon build up from around the injector.

5.1.3 Remove the cap from the injector using the socket (8) with the cut out. Refer to fig.3A.

5.2 Use of external adaptor. (See fig.3)

5.2.1 Identify the external thread adaptor (6) and separate the inner black part from the outer silver part by removing the screw from the top of the adaptor. Position the black part inside the top of the injector (see fig.3B) then place the silver part over it and screw it down firmly onto the external threads revealed when the cap was removed. Install the screw securely thus locking the adaptor parts tightly together with the injector thread and wall in between. This ensures a more secure fastening and reduces damage to the injector threads.

5.3 Use of internal adaptor. (See fig.4)

5.3.1 Remove the internal parts from the injector to gain access to use the security hex key (7). It may be necessary to remove the injector veins by force. Insert the security hex into the inner sleeve (see fig.4D). Turn the security hex anticlockwise using a 19mm socket and remove the inner sleeve.

5.3.2 Screw the internal adaptor (5) into the threads vacated by the inner sleeve and tighten with a 19mm spanner (See fig.4E).

5.4 Removing the injector.

5.4.1 Screw the slide hammer assembly securely onto the adaptor.

5.4.2 The injector can now be removed using reasonable force on the slide hammer. Be prepared for the sudden release of the injector from the cylinder head.

5.4.3 If the injector cannot be removed it may be necessary to consult a main dealer or a diesel specialist to avoid damage to the engine.

5.4.4 When an injector has been removed, it is recommended that only a new or refurbished injector is fitted. Follow manufacturers fitting and safety instructions.

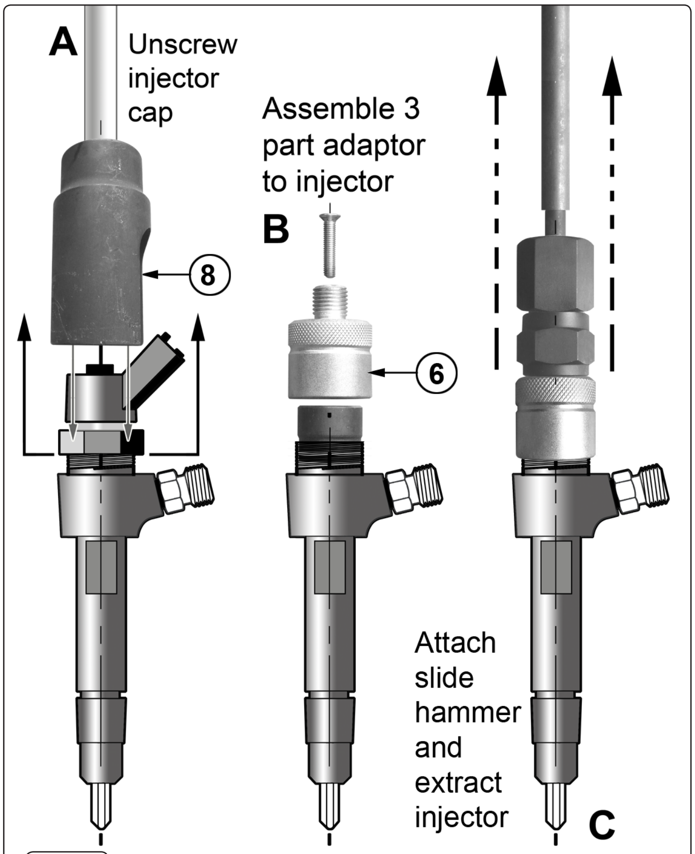

A
Unscrew injector cap
8
Assemble 3 part adaptor to injector
B
6
Attach slide hammer and extract injector
C

fig.3

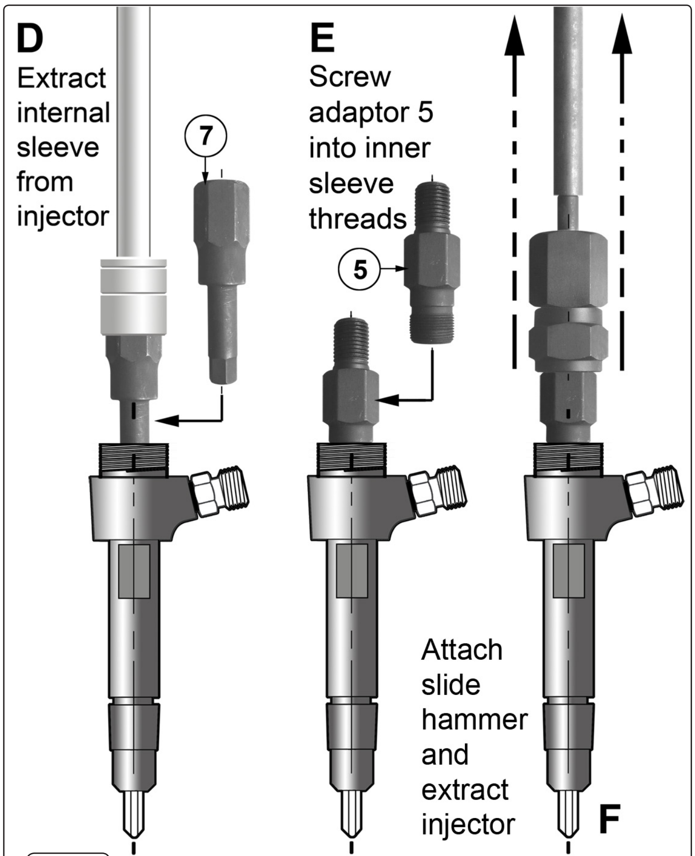

D
Extract internal sleeve from injector
7
E
Screw adaptor 5 into inner sleeve threads
5
Attach slide hammer and extract injector
F

fig.4

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INFORMATION: For a copy of our catalogue and latest promotions call us on 01284 757525 and leave your full name, address and postcode.

INSTRUCTIONS FOR:

DIESEL INJECTOR SEAT CLEANER SET 10pc

MODEL No: **VS2055.V4**

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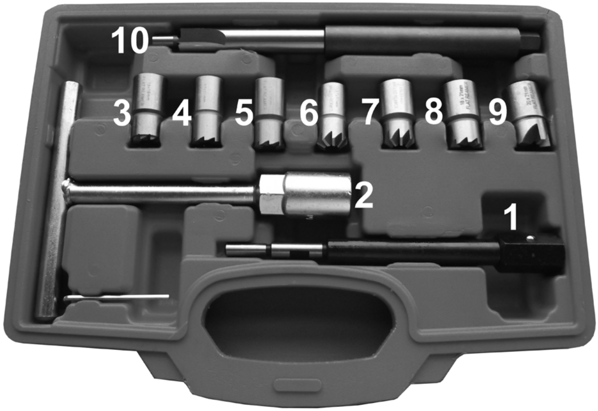
1. SAFETY INSTRUCTIONS

❐ **WARNING!** *Ensure Health and Safety, local authority and general workshop practice regulations are adhered to when using tools.*
✗ **DO NOT** use tools if damaged.
✓ Maintain tools in good and clean condition for best and safest performance.
✓ Ensure that a vehicle which has been jacked up is adequately supported with axle stands.
✓ Wear approved eye protection. A full range of personal safety equipment is available from your Sealey dealer.
✓ Wear suitable clothing to avoid snagging. **DO NOT** wear jewellery and tie back long hair.
✗ **DO NOT** use this tool when you are tired or under the influence of alcohol, drugs or intoxicating medication.
✓ Account for all tools, locking bolts, pins and parts being used and do not leave them in or near the engine.
❐ **WARNING!** Always use this tool with the cylinder head removed from the vehicle, to avoid carbon entering the cylinder bores which may damage the engine.
▲ ***IMPORTANT:*** *Always refer to the vehicle manufacturer's service instructions, or a proprietary manual, to establish the current procedure and data.*

2. INTRODUCTION

Set of seven diesel injector seat cleaners, ream, centring pilot and T-handle. Used to clean/decarbonise injector seats when changing injectors. Helps to avoid blow-back due to poorly seated injectors. Suitable for a wide range of vehicles.

Item	Description	Part Number
1	Centring Pilot	VS2055.V3-01
2	T-Bar	VS2055.V3-02
3	15 x 19 Reamer Various vehicles	VS2055.V3-06
4	17 x 17 Reamer Delphi/Bosch (BMW, PSA, Ford)	VS2055.V3-05
5	17 x 19 Reamer Bosch (Mercedes CRD)	VS2055.V3-03
6	17 x 17 Reamer Angled (Fiat, Iveco)	VS2055.V3-04
7	17 x 21 Reamer Angled (Fiat, Iveco)	VS2055.V3-07
8	18 x 21 Reamer Various Vehicles	VS2055.V4-08
9	20 x 21 Reamer Various Vehicles	VS2055.V4-09
10	15.5 Side Reamer	VS2055.V4-10



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3. OPERATION

❐ **WARNING!** Always use this tool with the cylinder head removed from the vehicle to avoid carbon entering the cylinder bores which may damage the engine.

3.1 Remove the injector and sealing washer from the cylinder head.

3.2 Select the appropriate reamer and fit onto the centring pilot, align the hex screw with the flat on the pilot and tighten using the 2.5mm hex key supplied.

3.3 Connect the T-Bar to the centring pilot and position the tool into the injection aperture.

3.4 Apply a small amount of lubricant to the injector seat and gently turn the reamer in a clockwise direction, until all the carbon deposits have been removed. **DO NOT** apply too much pressure and apply more lubricant if required.

❐ **WARNING!** Take care not to cut into the metal seat.

▲ ***IMPORTANT:*** *Always refer to the vehicle manufacturer's service instructions, or a proprietary manual, to establish the current procedure and data.*

Environmental Protection.
Recycle unwanted materials instead of disposing of them as waste.
All tools, accessories and packaging should be sorted, taken to a recycle centre and disposed of in a manner which is compatible with the environment.

NOTE: *It is our policy to continually improve products and as such we reserve the right to alter data, specifications and component parts without prior notice.*
IMPORTANT: No liability is accepted for incorrect use of this product.
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Original Language Version

INSTRUCTIONS FOR:

DIESEL INJECTOR PULLER SET - 14 PIECE

MODEL No: **VS2059.V2**

Thank you for purchasing a Sealey product. Manufactured to a high standard this product will, if used according to these instructions and properly maintained, give you years of trouble free performance.

⚠ ***IMPORTANT:*** **PLEASE READ THESE INSTRUCTIONS CAREFULLY. NOTE THE SAFE OPERATIONAL REQUIREMENTS, WARNINGS AND CAUTIONS. USE THE PRODUCT CORRECTLY AND WITH CARE FOR THE PURPOSE FOR WHICH IT IS INTENDED. FAILURE TO DO SO MAY CAUSE DAMAGE AND/OR PERSONAL INJURY AND WILL INVALIDATE THE WARRANTY. PLEASE KEEP INSTRUCTIONS SAFE FOR FUTURE USE.**

1. SAFETY INSTRUCTIONS

❐ **WARNING!** *Ensure Health and Safety, local authority and general workshop practice regulations are adhered to when using tools.*

❐ **WARNING! Always use caution when working around fuel systems. The fuel in the fuel rail may be pressurised even if the engine is not running.**

❐ ***IMPORTANT:*** *These instructions are provided as a guide only. Always refer to the vehicle manufacturer’s service instructions, or a proprietary manual, to establish the current procedure and data, also any warnings or cautions particular to the vehicle.*

✗ **DO NOT** use the set if any parts are missing or damaged.

✗ **DO NOT** use this tool for any purpose other than that for which it is designed.

✓ Switch off vehicle's ignition and disconnect the battery before commencing work under the bonnet.

✓ You must follow the vehicle's service manual cautions when working around the air bag system. If the cautions are not followed the air bag may deploy unexpectedly even after the ignition is turned ‘OFF’, resulting in personal injury.

✗ Never lay tools on the vehicle's battery. This may short the terminals together, causing harm to yourself, the tools, or the battery.

✓ Operate in a well ventilated area. Do not inhale fuel vapours.

✓ Wear approved eye protection. A full range of personal safety equipment is available from your Sealey dealer.

✓ Wear suitable clothing to avoid snagging. Do not wear jewellery and tie back long hair.

✓ Keep children and other unauthorised persons away from the working area.

✓ Keep yourself, tools, and test equipment away from hot engine parts.

✓ Always keep a fire extinguisher close by, that is suitable for fuel/ electrical/chemical fires.

✗ **NEVER** smoke or have open flames near vehicle.

✓ Always relieve fuel pressure before disconnecting fuel lines from injectors.

✓ Use a rag to cover fuel line fittings, when connecting or disconnecting fuel lines. Avoid contact with fuel.

✓ Clean up all fuel spills immediately and dispose of all rags properly.

✓ Maintain the tool components in good and clean condition for best and safest performance.

✓ When work on the vehicle is finished, ensure all connections on vehicle are restored, and that there are no tools left in the engine bay.

✓ Replace tools in the carrying case and store in a safe, dry, childproof location.

2. INTRODUCTION & CONTENTS

Suitable for the fast and safe removal of Bosch, Delphi, Denso, and Siemens diesel injectors. Set includes keys and deep, open profile sockets used to dismantle injectors plus adaptors for attaching the slide hammer securely to the body of the injector. Ball joint allows hammer to be used in confined areas.

Contents: (refer to fig.1)

Item	**Description**
1	Sliding Hammer
2	Handle
3	Shaft
4	Ball Joint Adaptor (3 piece)
5	Adaptors - (5 Pieces - 4 internal thread, 1 external thread)
6	External Adaptor - (3 piece)
7	Security Hex Key - ½"sq. drive
8	Sockets - (4 pieces - M25, M27, M29, M30 - ½"sq. drive)

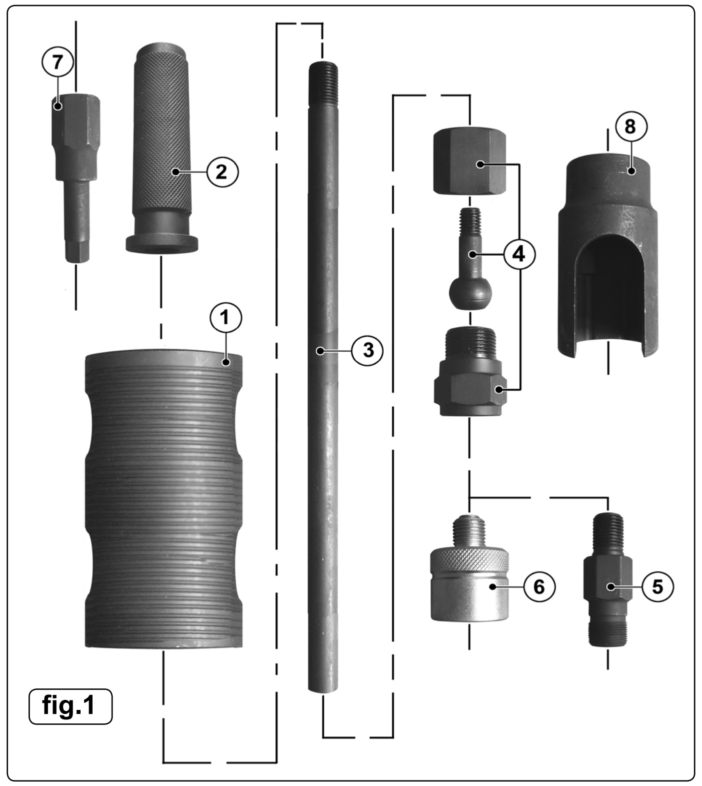


fig.1

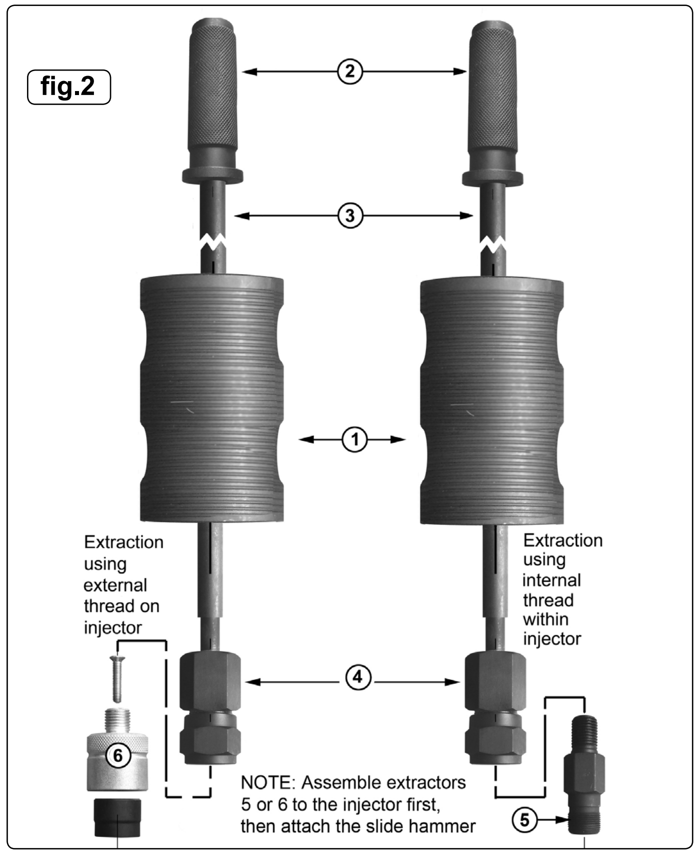


fig.2

Extraction using external thread on injector

Extraction using internal thread within injector

NOTE: Assemble extractors 5 or 6 to the injector first, then attach the slide hammer

3. ASSEMBLY

3.1. Referring to the individual components in fig.1. assemble the Injector Puller as shown in fig.2. overleaf.

3.2. Use adaptor 6 when the injector is being extracted using the external thread revealed when the injector cap has been removed.

3.3. Use one of the adaptors (5) when the injector is being extracted using the internal thread revealed when the inner sleeve has been removed from the injector.

4. OPERATION

NOTE: The technique required for removal of the injector will depend on which system is fitted to the vehicle. Always use an external adaptor first if possible. If by using reasonable force the injector cannot be removed, use an internal adaptor.

4.1. Before working on the fuel system, make sure that the fuel system is **NOT** pressurised. Refer to the manufacturer's instruction manual on how to de-pressurise the system.

4.1.1. Disconnect the injector wires and connections as per the manufacturer's instructions.

4.1.2. Remove any carbon build up from around the injector.

4.1.3. Remove the cap from the injector using the appropriate size socket (8). Refer to fig.3.A.

4.2. Use of external adaptor (fig.3).

4.2.1. Identify the external thread adaptor (6) and separate the inner black part from the outer silver part by removing the screw from the top of the adaptor.

4.2.2. Position the black part inside the top of the injector (see B) then place the silver part over it, and screw it down firmly onto the external threads revealed when the cap was removed.

4.2.3. Install the screw securely thus locking the adaptor parts tightly together with the injector thread and wall in between. This ensures a more secure fastening and reduces damage to the injector threads.

4.3. Use of internal adaptor (fig.4).

4.3.1. Remove the internal parts from the injector to gain access to use the security hex key (7). It may be necessary to remove the injector veins by force. Insert the security hex into the inner sleeve (see D). Turn the security hex anti-clockwise using a 21mm socket to remove the inner sleeve.

4.3.2. Screw the appropriate internal adaptor (5) into the threads of the injector and tighten with a suitable spanner (see E).

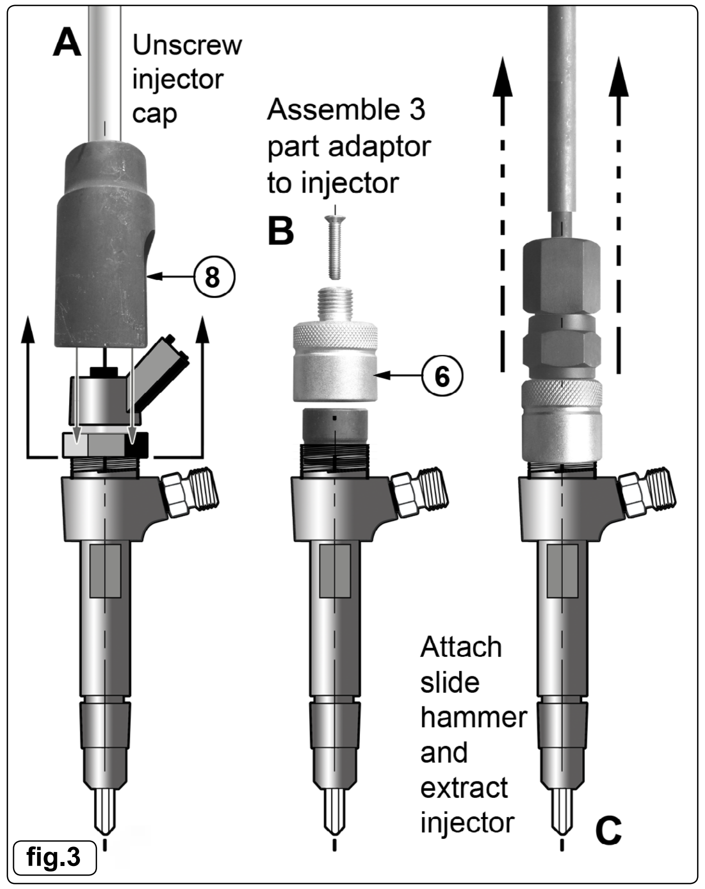
4.4. Removing the injector.

4.4.1. Screw the slide hammer assembly (handle, shaft and sliding hammer) securely onto the adaptor.

4.4.2. The injector can now be removed using reasonable force on the slide hammer. Be prepared for the sudden release of the injector from the cylinder head.

4.4.3. If the injector cannot be removed, it may be necessary to consult a main dealer or a diesel specialist, to avoid damage to the engine.

4.4.4. When an injector has been removed, it is recommended that only a new or refurbished injector is fitted. Follow manufacturers fitting and safety instructions.

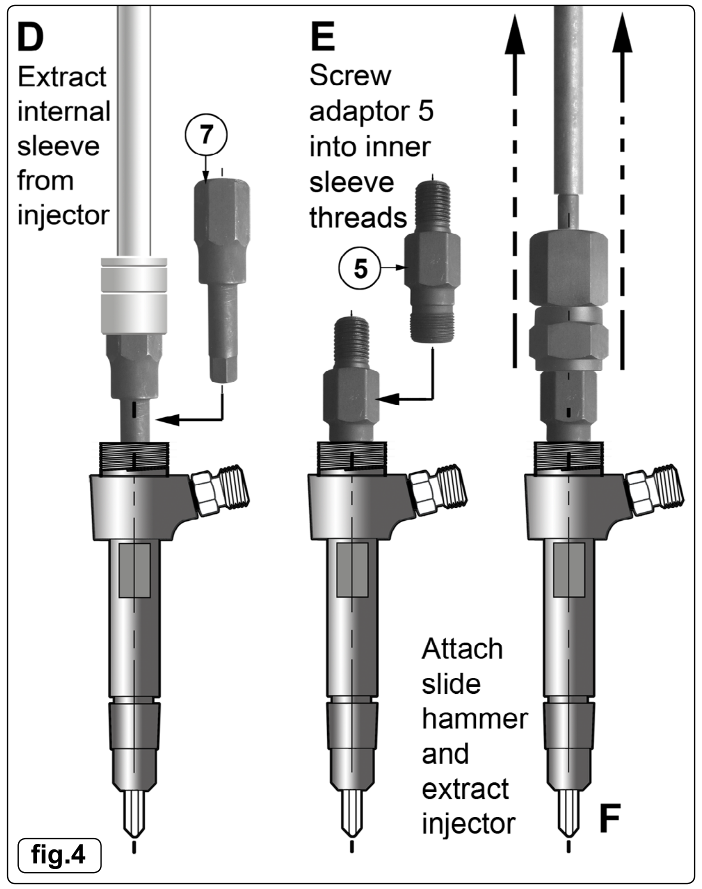


Unscrew injector cap

Assemble 3 part adaptor to injector

Attach slide hammer and extract injector

fig.3



Extract internal sleeve from injector

Screw adaptor 5 into inner sleeve threads

Attach slide hammer and extract injector

fig.4

NOTE: *It is our policy to continually improve products and as such we reserve the right to alter data, specifications and component parts without prior notice.*

IMPORTANT: No liability is accepted for incorrect use of this product.

WARRANTY: Guarantee is 12 months from purchase date, proof of which will be required for any claim.

INFORMATION: For a copy of our latest catalogue and promotions call us on 01284 757525 and leave your full name and address, including postcode.

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IP32 7AR

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sales@sealey.co.uk

SEALEY

INSTRUCTIONS FOR:

DIESEL INJECTOR MASTER KIT

MODEL No: **VS2064**

Thank you for purchasing a Sealey product. Manufactured to a high standard, this product will, if used according to these instructions and properly maintained, give you years of trouble free performance.

IMPORTANT: **PLEASE READ THESE INSTRUCTIONS CAREFULLY. NOTE THE SAFE OPERATIONAL REQUIREMENTS, WARNINGS & CAUTIONS. USE THE PRODUCT CORRECTLY AND WITH CARE FOR THE PURPOSE FOR WHICH IT IS INTENDED. FAILURE TO DO SO MAY CAUSE DAMAGE AND/OR PERSONAL INJURY AND WILL INVALIDATE THE WARRANTY. KEEP THESE INSTRUCTIONS SAFE FOR FUTURE USE.**

1. SAFETY

Read Instruction Manual

Wear Eye Protection

❐ **WARNING!** *Ensure Health and Safety, local authority and general workshop practice regulations are adhered to when using tools.*

❐ **WARNING! Always use caution when working around fuel systems. The fuel in the fuel rail may be pressurised even if the engine is not running.**

❐ ***IMPORTANT:*** *These instructions are provided as a guide only. Always refer to the vehicle manufacturer's service instructions, or a proprietary manual, to establish the current procedure and data, also any warnings or cautions particular to the vehicle.*

✗ **DO NOT** use the set if any parts are missing or damaged.

✗ **DO NOT** use this tool for any purpose other than that for which it is designed.

✓ Switch off the vehicle's ignition and disconnect the battery before commencing work under the bonnet.

✓ You must follow the vehicle's service manual cautions when working around the air bag system. If the cautions are not followed the air bag may deploy unexpectedly even after the ignition is turned 'OFF', resulting in personal injury.

✗ Never lay tools on the vehicle's battery. This may short the terminals together, causing harm to yourself, the tools, or the battery.

✓ Operate in a well ventilated area. Do not inhale fuel vapours.

✓ Wear approved eye protection. A full range of personal safety equipment is available from your Sealey dealer.

✓ Wear suitable clothing to avoid snagging. Do not wear jewellery and tie back long hair.

✓ Keep children and other unauthorised persons away from the working area.

✓ Keep yourself, tools, and test equipment away from hot engine parts.

✓ Always keep a fire extinguisher that is suitable for fuel/electrical/chemical fires close by

✗ **NEVER** smoke or have open flames near vehicle.

✓ Always relieve fuel pressure before disconnecting fuel lines from injectors.

✓ Cover fuel line fittings when connecting or disconnecting fuel lines to guard against high pressure leaks. Avoid contact with fuel.

✓ Clean up all fuel spills immediately and dispose of all waste according to local regulations.

✓ Maintain the tool components in good and clean condition for best and safest performance.

✓ When work on the vehicle is finished, ensure all connections on the vehicle are restored, and that there are no tools left in the engine bay.

✓ Replace tools in the carrying case and store in a safe, dry, childproof location.

2. INTRODUCTION

Suitable for the removal of Bosch, Delphi, Denso, Siemens and Pumpe Duse diesel injectors. Set includes keys and deep open profile sockets, used to dismantle injectors, plus a selection of adaptors for attaching the slide hammer securely to the body of the injector. Ball joint and choice of two sizes of slide hammer allow access in confined areas if required.

3. CONTENTS

Slide Hammers; 1.3kg with 150mm Shaft, 4kg with 400mm Shaft,
4kg Slide Hammer Handle
Flexible Joint
Security Hex Key 10mm
Adaptors Male: 10x1.5, 16x1.5, 17x1.0, 20x1.0, 25x1.0, 27x1.0mm
Adaptors Female: 14x1.5, 27x1.0mm (3pc)
Adaptors Hexagonal: 17mm (10x1.5 Female), 21mm (14x1.5 Female)
Adaptors 'C' and 'J' (Pump Duse)
Claw Adaptor
Injector Cap Sockets 1/2""Sq Drive: 25, 27, 29, 30mm

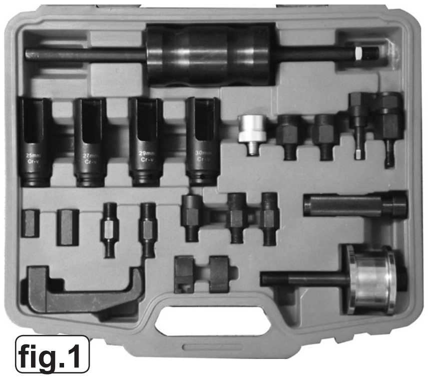
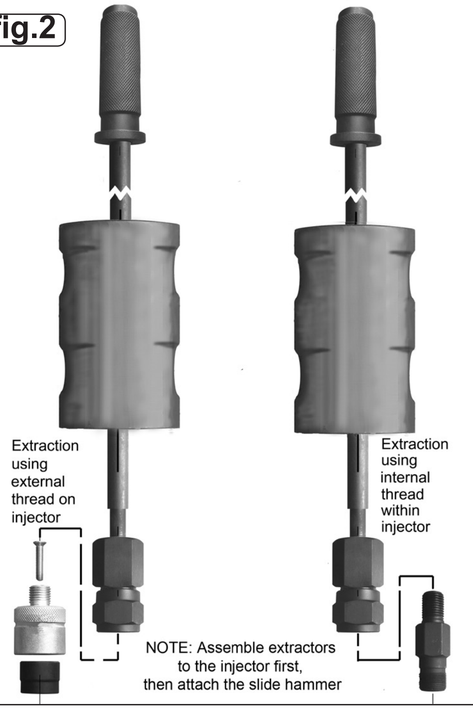


fig.1

fig.2


Extraction using external thread on injector
Extraction using internal thread within injector

NOTE: Assemble extractors to the injector first, then attach the slide hammer

© Jack Sealey Ltd

3. ASSEMBLY

3.1. Assemble the Injector Puller as shown in fig.2.

3.2. Use external adaptor when the injector is being extracted using the external thread revealed when the injector cap has been removed.

3.3. Use one of the conventional adaptors when the injector is being extracted using the internal thread revealed when the inner sleeve has been removed from the injector.

4. OPERATION

NOTE: The technique required for removal of the injector will depend on which system is fitted to the vehicle. Always use an external adaptor first if possible. If by using reasonable force the injector cannot be removed, use an internal adaptor or claw adaptor.

4.1. Before working on the fuel system, make sure that the fuel system is **NOT** pressurised. Refer to the manufacturer's instruction manual on how to de-pressurise the system.

4.1.1. Disconnect the injector wires and connections as per the manufacturer's instructions.

4.1.2. Remove any carbon build up from around the injector.

4.1.3. Remove the cap from the injector using the appropriate size socket. Refer to fig.3.A.

4.2. Use of external adaptor (fig.3).

4.2.1. Identify the external thread adaptor and separate the inner black part from the outer silver part by removing the screw from the top of the adaptor.

4.2.2. Position the black part inside the top of the injector (see B) then place the silver part over it, and screw it down firmly onto the external threads revealed when the cap was removed.

4.2.3. Install the screw securely thus locking the adaptor parts tightly together with the injector thread and wall in between. This ensures a more secure fastening and reduces damage to the injector threads.

4.3. Use of internal adaptor (fig.4).

4.3.1. Remove the internal parts from the injector to gain access to use the security hex key . It may be necessary to remove the injector vanes by force. Insert the security hex into the inner sleeve (see D). Turn the security hex anti-clockwise using a 21mm socket to remove the inner sleeve.

4.3.2. Screw the appropriate internal adaptor into the threads of the injector and tighten with a suitable spanner (see E).

4.4. Use of claw adaptor (fig.5).

4.4.1. Slide the forks of the claw adaptor onto the flats machined into the injector body (see F).

4.5. Removing the injector.

4.5.1. Screw the slide hammer assembly (handle, shaft and sliding hammer) securely onto the adaptor.

4.5.2. The injector can now be removed using reasonable force on the slide hammer. Be prepared for the sudden release of the injector from the cylinder head.

4.5.3. If the injector cannot be removed, it may be necessary to consult a main dealer or a diesel specialist, to avoid damage to the engine.

4.5.4. When an injector has been removed, it is recommended that only a new or refurbished injector is fitted. Follow manufacturers fitting and safety instructions.

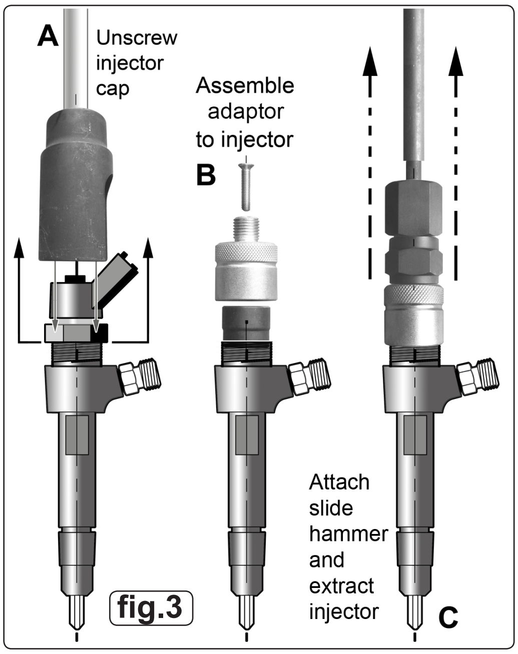

A
Unscrew injector cap
Assemble adaptor to injector
B
Attach slide hammer and extract injector
C

fig.3

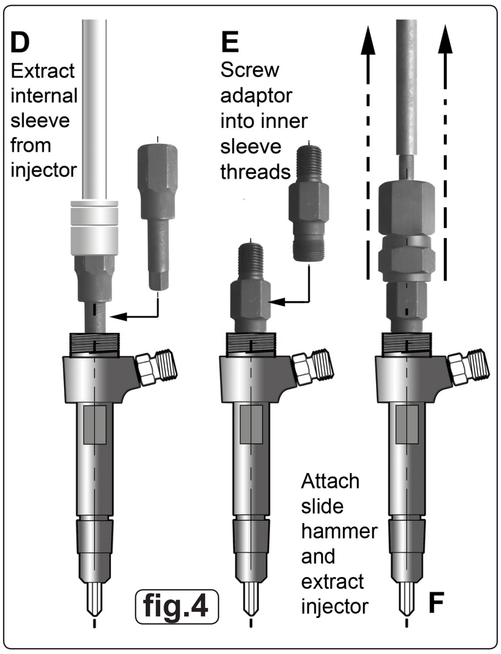

D
Extract internal sleeve from injector
E
Screw adaptor into inner sleeve threads
Attach slide hammer and extract injector
F

fig.4

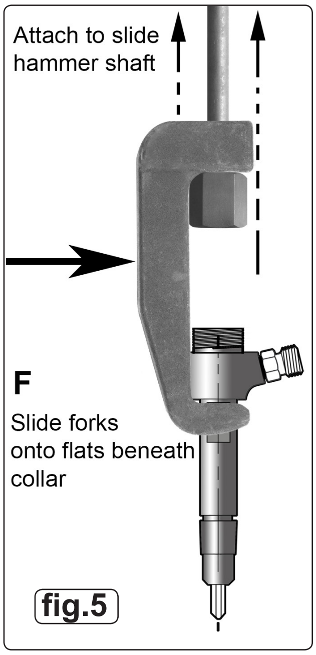

Attach to slide hammer shaft
F
Slide forks onto flats beneath collar

fig.5

Environmental Protection

Recycle unwanted materials instead of disposing of them as waste. All tools, accessories and packaging should be sorted, taken to a recycling centre and disposed of in a manner which is compatible with the environment. When the product becomes completely unserviceable and requires disposal, drain off any fluids (if applicable) into approved containers and dispose of the product and the fluids according to local regulations.

NOTE: *It is our policy to continually improve products and as such we reserve the right to alter data, specifications and component parts without prior notice.*
IMPORTANT: No liability is accepted for incorrect use of this product.
WARRANTY: Guarantee is 12 months from purchase date, proof of which will be required for any claim.
INFORMATION: For a copy of our latest catalogue and promotions call us on 01284 757525 and leave your full name and address, including postcode.

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IP32 7AR

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sales@sealey.co.uk

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Original Language Version

INSTRUCTIONS FOR:

DIESEL INJECTOR PULLER - BMW M47/M57

MODEL NO: **VS2075**

Thank you for purchasing a Sealey product. Manufactured to a high standard, this product will, if used according to these instructions and maintained properly, give you years of trouble free performance.

IMPORTANT: **PLEASE READ THESE INSTRUCTIONS CAREFULLY. NOTE THE SAFE OPERATIONAL REQUIREMENTS, WARNINGS & CAUTIONS. USE THE PRODUCT CORRECTLY AND WITH CARE FOR THE PURPOSE FOR WHICH IT IS INTENDED. FAILURE TO DO SO MAY CAUSE DAMAGE AND/OR PERSONAL INJURY AND WILL INVALIDATE THE WARRANTY. KEEP THESE INSTRUCTIONS SAFE FOR FUTURE USE.**

Refer to Instruction Manual **Wear Eye Protection**

1. SAFETY

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❐ **WARNING! Always use caution when working around fuel systems. The fuel in the fuel rail may be pressurised even if the engine is not running.**
❐ ***IMPORTANT:*** *These instructions are provided as a guide only. Always refer to the vehicle manufacturer's service instructions, or a proprietary manual, to establish the current procedure and data, also any warnings or cautions particular to the vehicle.*
✗ **DO NOT** use the set if any parts are missing or damaged.
✗ **DO NOT** use this tool for any purpose other than that for which it is designed.
✓ Switch off the vehicle's ignition and disconnect the battery before commencing work under the bonnet.
✓ You must follow the vehicle's service manual cautions when working around the air bag system. If the cautions are not followed the air bag may deploy unexpectedly even after the ignition is turned 'OFF', resulting in personal injury.
✗ Never lay tools on the vehicle's battery. This may short the terminals together, causing harm to yourself, the tools, or the battery.
✓ Operate in a well ventilated area. **DO NOT** inhale fuel vapours.
✓ Wear approved eye protection. A full range of personal safety equipment is available from your Sealey stockist.
✓ Wear suitable clothing to avoid snagging. **DO NOT** wear jewellery and tie back long hair.
✓ Keep children and other unauthorised persons away from the working area.
✓ Keep yourself, tools, and test equipment away from hot engine parts.
✓ Always keep a fire extinguisher that is suitable for fuel/electrical/chemical fires close by.
✗ **NEVER** smoke or have open flames near vehicle.
✓ Always relieve fuel pressure before disconnecting fuel lines from injectors.
✓ Cover fuel line fittings when connecting or disconnecting fuel lines to guard against high pressure leaks. Avoid contact with fuel.
✓ Clean up all fuel spills immediately and dispose of all waste according to local regulations.
✓ Maintain the tool components in good and clean condition for best and safest performance.
✓ When work on the vehicle is finished, ensure all connections on the vehicle are restored, and that there are no tools left in the engine bay.
✓ Replace tools in the carrying case and store in a safe, dry, childproof location.

2. INTRODUCTION

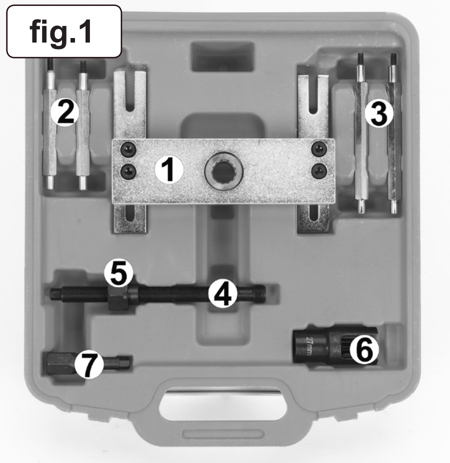
Designed for removing BMW 2.0, 2.5, 3.0 diesel fuel injectors from M47/M57 engines. Allows the removal of seized injectors without the need to remove the cylinder head. Bridge fits perfectly on the cylinder head preventing damage to the area surrounding the injector. Also suitable for some Land Rover, MG and Vauxhall/Opel vehicles that share the same engine.

3. APPLICATIONS

Model no:	**VS2075**
Applications:	BMW: 2.0, 2.5, 3.0
Engine Codes:	M47/M57

4. CONTENTS

fig.1



Key:

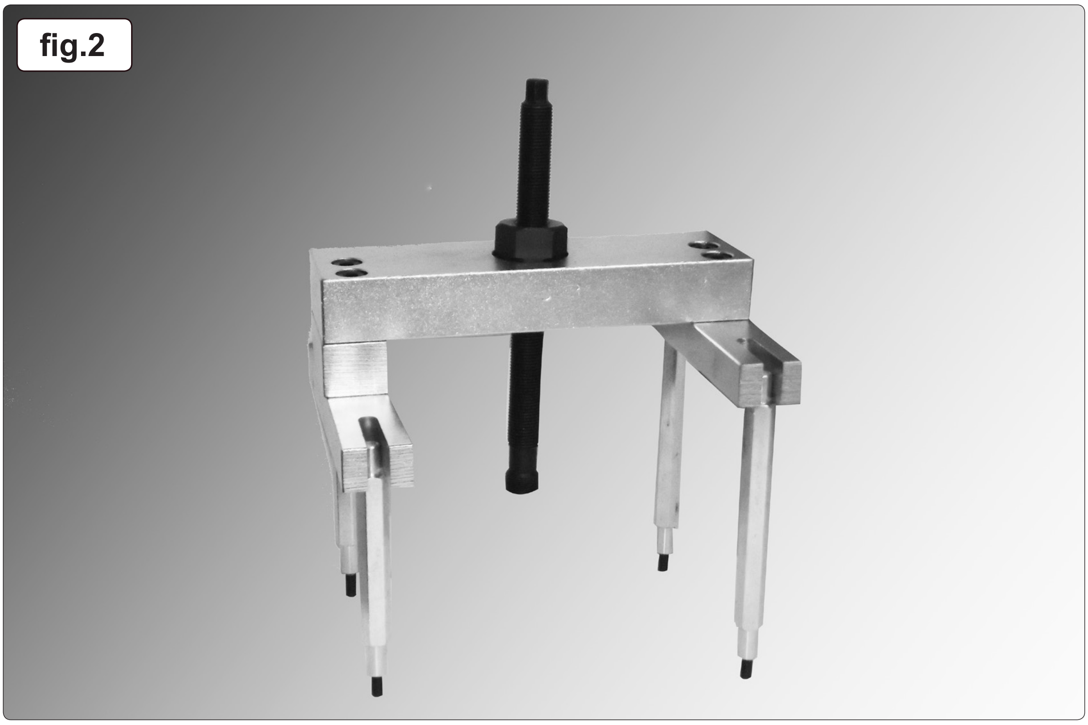
1: Pulling Bridge
2: Bridge Legs, short (x2)
3: Bridge Legs, long (x2)
4: Injector Force Screw Thread, Ø17mm male x 1mm pitch
5: Injector Force Screw Nut
6: Ø 27mm Injector Cap Socket
7: 10mm Security Hex Key

© Jack Sealey Limited

5. ASSEMBLY

5.1. Assemble parts as in fig.2.

fig.2



Environmental Protection

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NOTE: *It is our policy to improve products continually and as such we reserve the right to alter data, specifications and component parts without prior notice.*

IMPORTANT: No liability is accepted for incorrect use of this product.

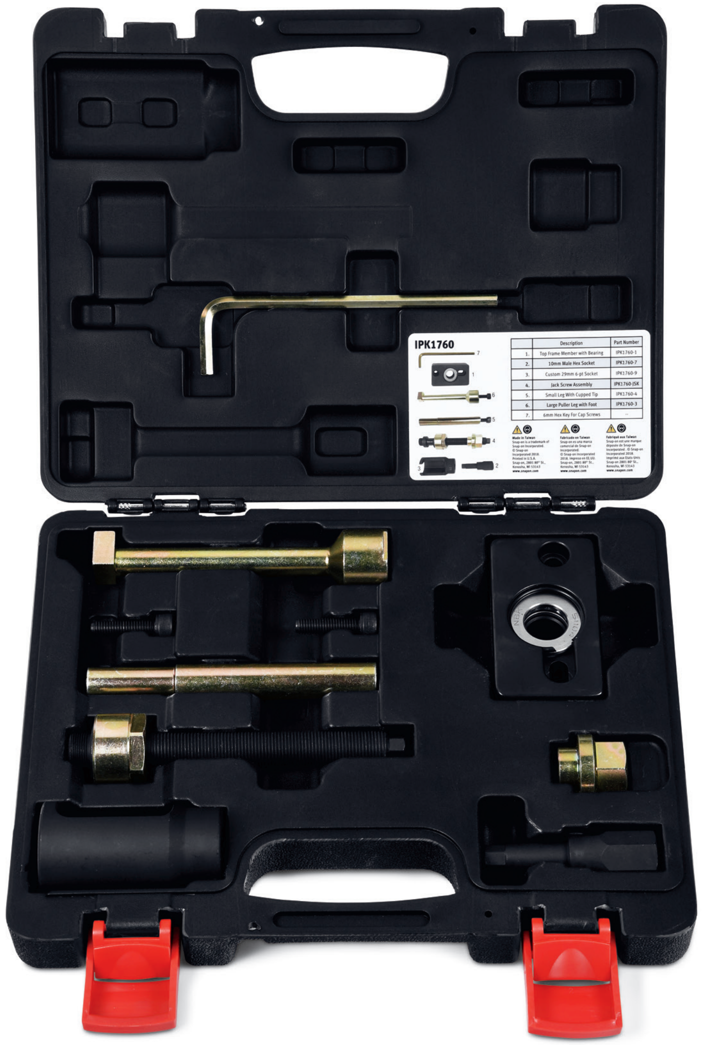
WARRANTY: Guarantee is 12 months from purchase date, proof of which will be required for any claim.

PRODUCT NEW PRODUCT

IPK1760

Sprinter Van Diesel Injector Puller Kit

Tool allows technician to service injectors and help avoid damage to the injector or valve cover, saving time and to complete job faster



Features and Benefits

- Removes stuck injectors in a fraction of the time versus using current methods
- Helps eliminate damage to valve cover
- Includes tools to remove top of the injector, clean the injector seat and thread chaser for clamp hole

Applications

Dodge® Sprinter® 2003-2009, 2.7L 2500 and 3500
Freightliner® Sprinter® 2002-2007, 2.7L 2500 and 3500

⚠ WARNING

Wear safety goggles (User and Bystander)
Read additional safety warnings on pages W1 to W4 in Catalog 1400

CE - Not Required

Country of Origin: TAIWAN

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ENGINE SERVICE

Cylinder Head Service & Engine Block	44-47
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Oil Service	56-57

KEY

DO NOT USE AIR TOOLS

P FOR USE WITH PETROL ENGINES

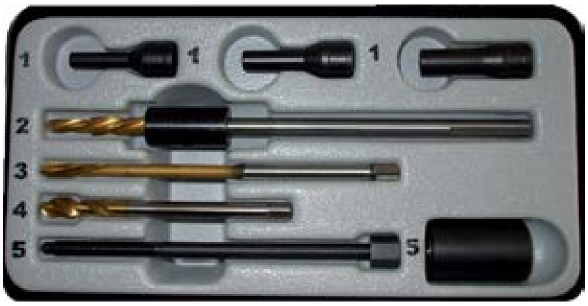
D FOR USE WITH DIESEL ENGINES

BELT FOR USE WITH BELT DRIVEN ENGINES

CHAIN FOR USE WITH CHAIN DRIVEN ENGINES

Diesel Glow Plug Removal Kits

- Sets of specialist drills and taps for the safe and effective removal of broken / damaged heater plugs
- Four kits available, covering the most popular sizes of heater plugs:
  - M8 x 1.0 / M9 x 1.0 / M10 x 1.0 / M10 x 1.25
- Each set contains precision engineered components, allowing for the removal of broken parts, without damaging the engine block and leaving a clean cut thread for fitting of the replacement heater plug
- Full instructions supplied with each kit



Each Kit Contains:
1. Extractor Socket Set
2. LH Fluted Drill – 2 step
3. LH Threaded Tap
4. Threaded Tap
5. Removal Tool & Impact Adaptor

Available Kits:

Part Number	Size (mm)	Popular Applications
08591000	M8 x 1.0	HDi 1.4 / 1.6, TDV6, New Mercedes CDi
08591500	M9 x 1.0	JTD 1.9 - CDTi 1.9
08592000	M10 x 1.0	HDi 2.0 / 2.2 BMW / Mercedes / VW
08592500	M10 x 1.25	Japanese

08591000 Spare Parts:
- 085910-01 - Extractor Socket Set (Sizes 0,1,2)
- 085910-02 - Special LH 2 step drill 7mm x 150mm
- 085910-03 - LH Spiral Point Tap M6
- 085910-04 - Glow Plug Thread Tap M8
- 085910-05 - LH Extractor M6

08591500 Spare Parts:
- 085915-01 - Extractor Socket Set (Sizes 0,1,2)
- 085915-02 - Special LH 2 step drill 8mm x 180mm
- 085915-03 - LH Spiral Point Tap M6
- 085915-04 - Glow Plug Thread Tap M9
- 085915-05 - LH Extractor M6

08592000 Spare Parts:
- 085920-01 - Extractor Socket Set (Sizes 0,1,2)
- 085920-02 - Special LH 2 step drill 9mm x 180mm
- 085920-03 - LH Spiral Point Tap M7
- 085920-04 - Glow Plug Thread Tap M10
- 085920-05 - LH Extractor M7

08592500 Spare Parts:
- 085925-01 - Extractor Socket Set (Sizes 0,1,2)
- 085925-02 - Special LH 2 step drill 9mm x 180mm
- 085925-03 - LH Spiral Point Tap M7
- 085925-04 - Glow Plug Thread Tap M10 x 1.25
- 085925-05 - LH Extractor M7

Glow Plug Removal Kit

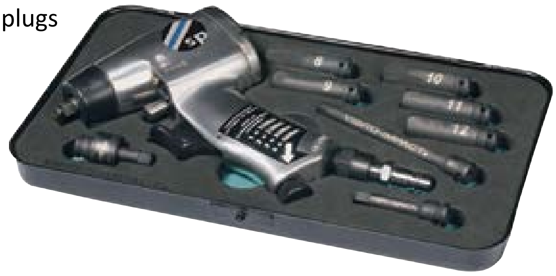
08593000

- For removing damaged and broken glow plugs from cylinder heads
- Ideal for use where a glow plug has sheared off just below the hex, or flush with the cylinder head
- Removes 8mm & 10mm glow plugs (M8 x 1.0 thread or M10 x 1.0 thread)
- Comprehensive kit includes all necessary adaptors, centering and thread cleaning tools to safely remove the damaged glow plug without damaging the cylinder head

Spare Parts:
- 085930-01 - Ratchet T-Bar
- 085930-02 - Drill Holding Adaptor
- 085930-03 - Puller Outer Housing
- 085930-04 - Force Screw
- 085930-05 - Force Nut
- 085930-06 - Star Socket
- 085930-07 - Allen Key
- 085930-08 - Dual Size Step Drill M8
- 085930-09 - Dual Size Step Drill M10
- 085930-10 - Pilot Drill Centering Sleeves
- 085930-11 - Pilot Drill 3.5mm
- 085930-12 - Tap 1/4”
- 085930-13 - Tap M8
- 085930-14 - Tap M10
- 085930-15 - Puller Adaptor Mandrel

Vibro Impact Glow Plug Remover Kit

085900V2



- For the safe, effective removal of 8mm, 9mm, 10mm, 11mm & 12mm glow plugs
- Uses controlled impact torque to create vibration in order to loosen seized glow plugs
- The Vibro-Impact tool 'loosens' the seized glow plug, making it safe and easy to remove without the risk of broken plugs, and / or damaged cylinder heads
- Includes 4 low-torque settings for controlled torque vibration (10, 20, 30, 40Nm)
- Supplied with special long-reach 8, 9, 10, 11 & 12mm glow plug sockets, long and short extensions and universal joint for ease of access
- This kit is also effective for:
  The removal of any small threaded fixings (up to 12mm thread size) e.g.
  - Spark Plugs (particularly useful for Ford and Alfa Romeo Twin Spark engines)
  - Exhaust manifold studs
  - Engine sump fixings

Square Drive	¼"
Max Torque - Right	40Nm
Max Torque - Left	10 / 20 / 30 / 40Nm
Air Inlet	¼"
Air Consumption	250 ltrs / min
Speed	12,000 per min
Air Supply	6.3bar / 90psi

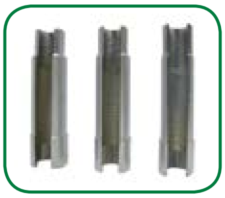
Spare Parts:

- 08590170 - 1/4" Impact Gun
- 08590270 - Universal Joint
- 08590370 - Impact Socket 8mm
- 08590470 - Impact Socket 10mm
- 08590570 - Impact Socket 12mm
- 08595170 - Impact Socket 9mm
- 08595270 - Impact Socket 11mm
- 08595370 - Short Extension
- 08595470 - Long Extension

Glow Plug Socket Set

08593500

- Specially designed sockets for gaining access to the glow plug where the cable restricts access
- Sockets have a lateral slot which goes over the cable attached to the glow plug - No need to disconnect wires from glow plug
- 8mm / 9mm / 10mm sockets
- Applications include: Alfa, Fiat, Saab, Vauxhall / Opel - also some PSA models



Extra Long Glow Plug Socket Set

08597500

- Extra Long Glow Plug sockets (150mm) with universal joint for restricted access
- Designed to grip plug being extracted
- Sizes: 8mm, 9mm, 10mm, 12mm, 14mm, 16mm
- Extra long 150mm & 3/8" Drive
- Includes universal joint for restricted access

Mercedes Diesel Fuel Injection Socket

01515500

- 33 tooth – ½" sq dr
- Special socket for removing and mounting the pressure valve holder on the Diesel Injection Pump
- Outside Diameter - 23.9 mm
  Length - 55 mm
- Internal measurement across the inside of the teeth (Bolt Head Measurement) approx 19.45mm

Applications:

Mercedes Diesel Engine Series: 601, 602, 603, 605, 606, 615, 616, 617

Valve Spring Compressor - Heavy Duty

03800000

- Suitable for use on a wide range of medium and heavy commercial vehicles, buses, agricultural, marine and industrial plant engines
- Reinforced frame made from rust-proofed steel
- Geared hand wheel adjustment
- Supplied with straight & cranked off-set jaws

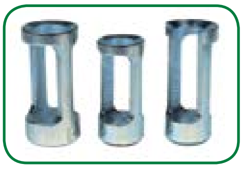
Spare Parts:

- 03801100 - Straight Jaws
- 03801200 - Cranked Offset Jaws

Valve Spring Compressor - Multivalve Engines

03950000

- For the removal of valves on multivalve petrol & diesel engines
- Reinforced frame made from rust-proofed steel
- Supplied with 23mm & 28mm valve spring adaptors



Spare Parts & Optional Adaptors:

- 03950100 - Multivalve VSC Adaptor: 28mm (OD) 21mm (ID)
- 03950200 - Multivalve VSC Adaptor: 23mm (OD) 18mm (ID)
- 03950400 - Multivalve VSC Adaptor: 30mm (OD) 18mm (ID) Restricted Access & BMW
- 03950500 - Multivalve VSC Adaptor: 21mm (OD) 15mm (ID) VW Group & Motorcycle

Valve Spring Compressor - OHC Engines

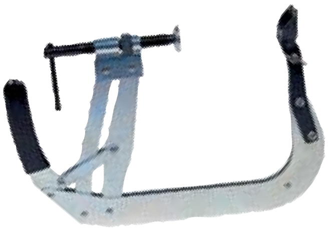
66043000

- For OHC petrol & diesel engines
- Will also fit a wide variety of smaller OHV engines
- Cam action provides parallel lift
- Open collet type jaw provides good visibility for difficult access applications

Valve Spring Compressor - OHV Engines

66021000

- For the removal of valves on small / medium OHV engines
- Cam action provides parallel lift
- Automatic locking action
- Supplied with straight adjustable width jaws

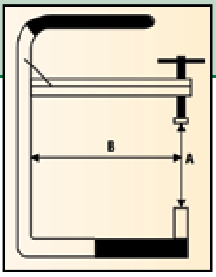


Valve Spring Compressors

Technical Specifications

	A - Jaw (mm)		B - Throat (mm)
	Min	Max	
03800000			
Cranked Offset Jaws	75mm	165mm	245mm
Straight Jaws	95mm	186mm	245mm

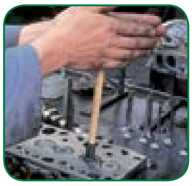
	A - Jaw (mm)		B - Throat (mm)
	Min	Max	
03950000	35mm	142mm	150mm
66021000	70mm	135mm	150mm
66043000	63mm	129mm	158mm



Note: Dimensions quoted are with tool fully compressed

Valve Grinding Sticks

- Wooden handled valve sticks for grinding and lapping valves

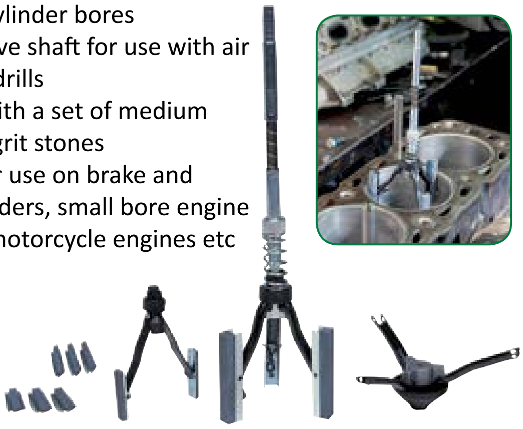


Part Number	Description	Size
66090200	Large Cup - Ideal for HGV, agricultural and industrial plant engines	Single-Ended - 32mm x 224mm
66090300	Medium Cup - Ideal for cars and light commercial vehicles	Single-Ended - 22mm x 224mm
66090400	Small Cup - Ideal for cars, motorcycles and generator engines	Single-Ended - 19mm x 224mm
66090500	Small / Medium Cup	Double-Ended - 19 / 22mm x 224mm

Cylinder Honing Set (13 - 89mm)

02800000

- Complete honing and deglazing set for 13 - 89mm diameter cylinder bores
- Flexible drive shaft for use with air or electric drills
- Supplied with a set of medium grade 220 grit stones
- Suitable for use on brake and clutch cylinders, small bore engine cylinders, motorcycle engines etc



Replacement Stone Sets:

• 02800100 - Grade: Fine	Grit: 400
• 02800200 - Grade: Medium	Grit: 220
• 02800300 - Grade: Course	Grit: 100

Note: Each Stone Set consists of 3 x 19mm stones / 3 x 29mm stones / 3 x 50mm stones and 9 x replacement spring clips

Cylinder Honing Set (50 - 180mm)

02810000

- Large diameter honing and deglazing tool
- Flexible drive shaft for use with air or electric drills
- Supplied with a set of medium grade 220 grit stones
- Suitable for use on large bore engine cylinders from 50 -180mm

Replacement Stone Sets:

• 02810100 - Grade: Fine	Grit: 400
• 02810200 - Grade: Medium	Grit: 220
• 02810300 - Grade: Course	Grit: 100

Note: Each Stone Set consists of 3 x 100mm stones and 3 x replacement cotter pins

Piston Ring Compressor - Ratchet Action

66037000

- Medium capacity piston ring compressor suitable for cars and LCVs
- Spring assisted ratchet type lock complete with square drive key
- Standard 80mm depth, 57 - 125mm capacity

Piston Ring Compressor - Ratchet Action - Large Capacity

66037300

- Large capacity piston ring compressor
- Spring assisted ratchet type lock complete with square drive key
- Standard 80mm depth, 90 - 175mm capacity
- Suitable for Commercial Vehicles, industrial and agricultural engines

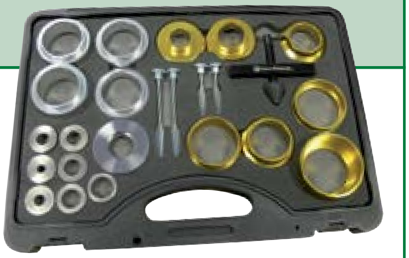
Piston Ring Compressor - Ratchet Action - Large Capacity - Long Reach

03220000

- Large capacity, long reach, piston ring compressor
- Spring assisted ratchet type lock, complete with square drive key
- Double-Depth 165mm, 90 - 175mm capacity
- Suitable for Heavy Commercial Vehicles, industrial and agricultural engines

Seal Removal & Replacement Kit

08529500



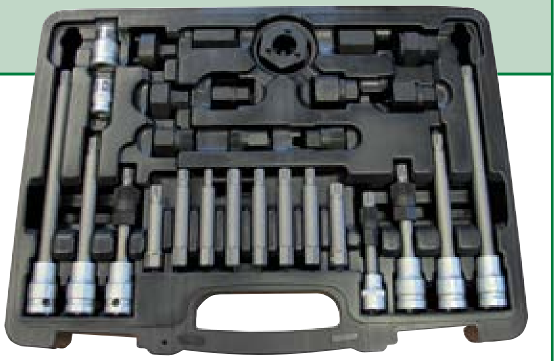
- Remove & install awkward seals as found on engines, gear boxes, power steering pumps etc
- Reduces risk of surface damage
- Universal coverage for seals 27-58mm diameter
- Includes seal puller, short extracting hooks for easily accessed seals - e.g. on camshafts, long extracting hooks for deep set seals or ones sat on protruding shafts - e.g. crankshafts, seals, selection of bushes, sleeves and mandrels for installing new seals

Spare Parts:

- 085295-01 - Leg Set (Set of 4, 2 x large and 2 x small)

Alternator Free Wheel Pulley Set - 29 Piece

016795V2



- Special set of Spline & Torx Socket Bits for the removal of free-wheel alternator pulleys
- Locks the alternator, allowing the central locking bolt of the pulley to be released
- Selection of 33 tooth reaction nuts and additional adaptors
- Updated 29 piece set covers a wide range of popular applications including:
  - BMW, Citroën, Fiat, Ford, Mercedes, Opel, Peugeot, Porsche, Renault, Toyota, VW Group, Vauxhall, Volvo
- Applications list included - Visit www.sykes-pickavant.com for full details

Spare Parts:

- 016795-01 - 1/2’’ Bit Socket x M10 - Spline 10 (200mm)
- 016795-02 - 1/2’’ Bit Socket x M10 - Spline 10 (140mm)
- 016795-03 - 1/2’’ Bit Socket x M10 - Spline 10 + 33 teeth (110mm)
- 016795-04 - 3/8’’ Bit Socket x M10 - Spline 10 + 31 teeth (90mm)
- 016795-05 - 1/2’’ Bit Socket x T50 - Torx 50 + 33 teeth (110mm)
- 016795-06 - 1/2’’ Bit Socket x T50 (140mm)
- 016795-07 - 1/2’’ Bit Socket x T50 (200mm)
- 016795-08 - 3/8’’ Bit Adaptor x 10mm (30mm)
- 016795-09 - 1/2’’ Bit Adaptor x 10mm (35mm)
- 016795-10 - Hex 10mm bit x M8 - Spline 8 (75mm)
- 016795-11 - Hex 10mm bit x M10 - Spline 10 (75mm)
- 016795-12 - Hex 10mm bit x H8 - Hexagon 8 (75mm)
- 016795-13 - Hex 10mm bit x H10 - Hexagon 10 (75mm)
- 016795-14 - Hex 10mm bit x T40 (75mm)
- 016795-15 - Hex 10mm bit x T50 (75mm)
- 016795-16 - Hex 12mm bit x T50 (64mm)
- 016795-17 - Hex 12mm bit x M10 - Spline 10 (64mm)
- 016795-18 - Multipoint - Hex 15mm x 33 teeth (30mm)
- 016795-19 - Multipoint - Hex 17mm x 33 teeth (30mm)
- 016795-20 - Multipoint - Hex 22mm x 33 teeth (30mm)
- 016795-21 - Hexagon Adaptor - Hex 17mm (35mm)
- 016795-22 - Hexagon Adaptor - Hex 22mm (30mm)
- 016795-23 - Hexagon Adaptor - Hex 21mm x Hex 28mm (35mm)
- 016795-24 - Hexagon Adaptor - Hex 19mm x Hex 28mm (35mm)
- 016795-25 - Hexagon Adaptor - Hex 22mm x Hex 28mm (30mm)
- 016795-26 - Hexagon Adaptor - Hex 17mm x Hex 21mm (30mm)
- 016795-27 - Hexagon Adaptor - Hex 15mm x Hex 28mm (30mm)
- 016795-28 - Hexagon Adaptor - Hex 38mm x 3 pin (17mm)
- 016795-29 - Round Socket - Hex 15mm - 4 pin (30mm)

Flexible Auxiliary Drive Belt Fitting Tool

07740000

- Designed to assist in the fitting of new style alternator / air-con / power steering drivebelts, which have no load adjustment mechanism and are designed to be “stretched” into place
- Guides the belt into the correct position, whilst turning the crankshaft pulley by hand
- Steel guide pins help lock the tool in-situ, whilst the alloy body guides the belt over the edge of the pulley, and supports the load on the belt during the fitting process

Stretch Belt Fitting Tools – Dual Size Pulleys

07744400

- Stretch Belt Tool for Double Pulley applications
- Specially designed two-piece tool for installing and dismounting stretch belts on double pulleys where the two pulleys are of different diameters
- Allows the belt to be installed in one operation
- Ideal tool for Ford Focus applications with double pulley

Sliding Ribbed Pulley Puller

07743500

- Pulley puller for grooved belt pulleys
- Pulling arms slide and lock in position for safety and security
- Designed for both servicing and engine rebuild operations
- Universal Applications

Self Adjusting Clutch (SAC) Installer Kit

01360000

- For dis-mounting and mounting SAC assemblies to the flywheel
- Approved Clutch Manufacturer's method for SAC assemblies
- Applications include: Alfa Romeo, Audi, BMW, Fiat, Ford, Mercedes, VW and more
- Wide applications coverage for 120° (3 screw) SAC assemblies
- Allows Pressure Plate to be pre-tensioned before removal and re-fitting of clutch
- Avoids clutch plate distortion and accidental damage due to incorrect fitting and subsequent vibration and shortening of clutch life

Dual Mass Flywheel – Special Tool

081100SP

- Developed in conjunction with LUK, to allow accurate testing of the Dual Mass Flywheels (DMF) unit, whilst it is still mounted on the vehicle, with the gear box removed
- DMF units are designed to dampen out unwanted engine vibration, particularly important on modern high speed diesel engines
- By dampening unwanted vibration, engine and transmission components can be made lighter, in order to maximise the higher power outputs available from the modern diesel engine
- DMF units are designed to last the life of 2 clutch units, assuming correct vehicle usage and normal load conditions
- Includes all the components required to test the DMF including the LUK specific DMF data, instructional CD and Data Wheel which are vital to the correct operation of the kit
- The Data Wheel, provides the specific data, per application, to allow the technician to correctly evaluate the DMF

Spare Parts:

- 081100-01 - Slotted Bar
- 081100-02 - Ring Gear Locking Dogs
- 081100-03 - Ring Gear Locking Dogs Spacers
- 081100-04 - Adaptors & Nuts Set
- 081100-05 - Degree Gauge
- 081100-06 - Degree Gauge Locking Bar
- 081100-07 - DTI Gauge
- 081100-08 - DTI Stand

5th Gear Puller - Ford

08550500

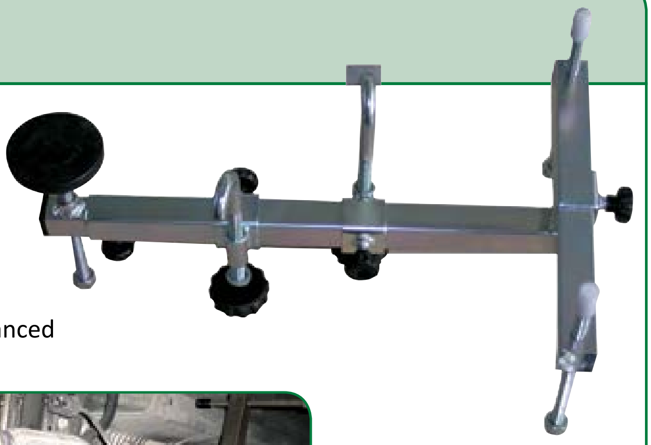
- Fast and simple method of removing the fifth gear on Ford front wheel drive transmissions before carrying out internal repairs
- The split collar and retaining sleeve ensures a safe and positive location

Applications:

- **B5 Gearboxes:**
  Manual 5 speed fifth gear puller (pre -1995)
- **IB5 from 1995 – present:**
  Fiesta to date / Ka 1 1996 – 2008 / Focus 1
- **MTX-75:**
  Focus 1, 2 & 3 from Zetec onwards to date (inc C Max 1) / Mondeo / Jaguar X Type
- **VXT-75:**
  Galaxy 1 1995 – 2006 / Transit FWD & Transit Connect to date

Universal Engine & Gearbox Support

38360000



- Designed to support the engine or gearbox when the engine mountings have been removed - e.g. When replacing timing / drive belts, water pumps etc
- Removes the need for using cranes, transmission jacks etc
- Universal tool designed for all makes of vehicle - No need for costly model specific brackets
- The unit is suspended from the chassis via the support hooks, the engine / gearbox is supported by the support pad and is counter-balanced against the underside of the vehicle by the support arms
- Fully adjustable in all dimensions:
  - Extension: Min 630mm / Max 960mm
  - Support Plate Adjustment: 190mm

Scan the QR code to watch a video of the Universal Engine & Gearbox Support

Spare Parts:

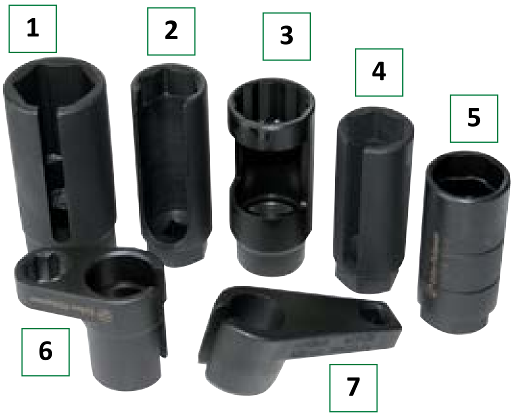
- 38360000-01 - Support Pad & Adjustable Bar

Oxygen (Lambda) Sensor Socket Set

01690000

- Set of 7 specialist sockets for the removal and installation of all common sizes of Oxygen Sensors and Pressure / Vacuum Sensors & Switches
- Suitable for both heated and unheated oxygen sensors

	Part Number	Size (mm)	Depth (mm)	Slot (mm)	Offset (mm)
1	**01690100**	29	90	8	-
2	**01690200**	22	90	21	-
3	**01690300**	27	85	27 (window)	-
4	**01690400**	22	80	8	-
5	**01690500**	1 1/16	75	-	-
6	**01690600**	22	50	10	30
7	**01690700**	22	30	8	55



Exhaust Pipe Cutter

02180000

- Chain type pipe cutter, ideal for use with exhausts
- Suitable for aluminium, copper, brass, steel
- Capacity:
  28 – 68mm diameter

Spare Parts:

- 02180100 - Replacement chain

Professional Feeler Gauges

01640000

- 26 blades cranked
- Thickness Range:
  0.005mm - 0.762mm
- 45° angle off-set allows for use where access is restricted

Glow Plug & Spark Plug Thread Recovery Set

01419000

- For the repair of plug threads within the cylinder head
- Repairs thread from the bottom, to minimise the risk of debris entering the engine
- Made from hardened and tempered steel
- Contents: (all sizes have hex drive)

- M8 x 1.00 – 117mm length
- M10 x 1.0 – 117mm length
- M12 x 1.25 – 140mm length
- M12 x 1.25 – 268mm length
- M14 x 1.25 – 140mm length
- M14 x 1.25 – 268mm length
- M18 x 1.50 – 89mm length

Spark Plug Thread Chaser - 14 / 18mm

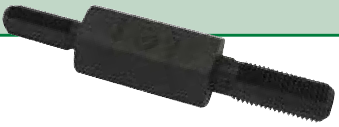
01410000

- Cleans and reforms threads in cylinder heads

Spark Plug Thread Chaser - 10 / 12mm

01440000

- Cleans and reforms threads in cylinder heads



Magnetic Extra Long Slim Spark Plug Socket - 14mm

03341600

- 250mm Long Bi-Hex 3/8 Sq Dr
- For deep-seated spark plugs as found on: Citroën, Mini, Nissan, Peugeot and Toyota vehicles
- Ideal for use on Bi-Hex spark plugs

Injector Removal Socket – 21mm

01510100

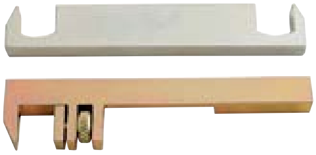
- For the removal of 21mm Injectors
- Commonly found on Ford Duratorq engines

Injector Alignment Tool

01511500

- A set of tools for aligning the injectors to the fuel lines following repair work
- Specifically required for Ford Duratorq 2.0 / 2.2 / 2.4 Diesel Engines

Applications:
Ford Mondeo / Ford Transit / Jaguar X Type



Electronic Diesel Injector Removal Socket Set

01513500

- Hexagonal socket set for removal of the electrical solenoid from modern diesel injectors
- 1/2” sq dr. x 78mm length
- In most cases, it is necessary to remove the solenoid before attempting to remove the injector body
- Includes 4 x sockets:
  - 25mm Hex – Siemens Injectors - 2.0 Hdi (DW Series) As found on PSA, Ford, Toyota etc
  - 27mm Hex – Siemens Piezo Injectors – 2.0 Hdi Piezo (DW Series) As found on PSA etc
  - 29mm Hex – Bosch type injectors – Bosch Cdi / Hdi engines
  - 30mm Hex – Bosch type injectors – Bosch Renault / Nissan 1.9dCi

Spare Parts:

- 01512500 - 25mm Hex
- 01512700 - 27mm Hex
- 01512900 - 29mm Hex
- 01513000 - 30mm Hex

Diesel Injector Washer Extractor
08581000

- Designed specially to remove the copper injector base seal when it has become stuck in the cylinder head
- Traditionally done using a ‘pick’ – this tool allows safe and easy removal without risk of damage to the head
- Simple to use – utilises SP’s well known “split collet” technology to grip the seal and allow it to be pulled out from the head
- Simple adjustment – expands from 6.5mm to 8.0mm
- No need to use picks, hooks etc when trying to retrieve stuck seals & washers

Scan the QR code to watch a video of the Diesel Injector Washer Extractor

Spare Parts:
- 09580900 - Split Collet 6.5 - 8.0mm

Heavy Duty Diesel Injector Washer Extractor
08581500

- Tapered threaded rod with Slide Hammer, for retrieving washers from the injector seat once the injector has been removed
- Suitable for both modern common rail applications and older applications
- Car / LCV / HGV
- 350mm in length – 500gm Slide Hammer Weight
- The tapered threaded end is screwed into the washer which is stuck in the Injector Seat
- Once the washer ‘bites’, the tool is then used as a slide hammer to remove the washer
- Ideal for use when carbon deposits have completely enclosed the injector seat washer

Diesel Injector Seat Cleaner Set
017500V2

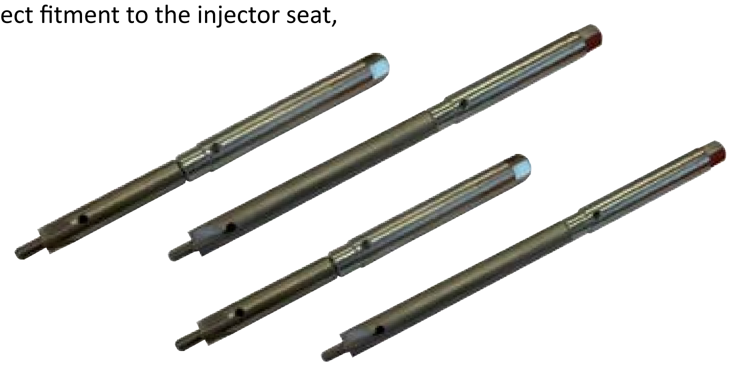
- Cleans injector seats and chambers when changing or reconditioning diesel injectors
- Helps to avoid blow-back due to poorly seated injectors
- Now includes:
  - Removal tool for copper washers
  - Injector blanking plugs to avoid debris entering the cylinders
  - Wire brush cleaning set for chamber walls
  - Centralising stem to improve correct cleaning seating angle

Spare Parts:
- 01750170 - Seat Cleaner No. 1
- 01750270 - Seat Cleaner No. 2
- 01750370 - Seat Cleaner No. 3
- 01750470 - Seat Cleaner No. 4
- 01750570 - Seat Cleaner No. 5
- 017500-02 - Top Cone & Spring Shaft Set
- 017500-03 - Pin & Plug Set
- 017500-04 - Brush Set

Injector Seat Re-Surfacing Tools

- A range of high quality, specialist reamers for injector seat resurfacing
- Each tool features a unique centering probe to ensure correct fitment to the injector seat, is adjustable for depth and has a 17mm hex drive
- Damage to the injector seat and injector edge is avoided

Part Number	Applications
01760200	17mm dia for Delphi injectors
01760300	17mm dia for Siemens injectors
01760400	15.5mm dia for Bosch injectors
01760500	17–19mm dia for Bosch injectors



Diesel Injector Puller

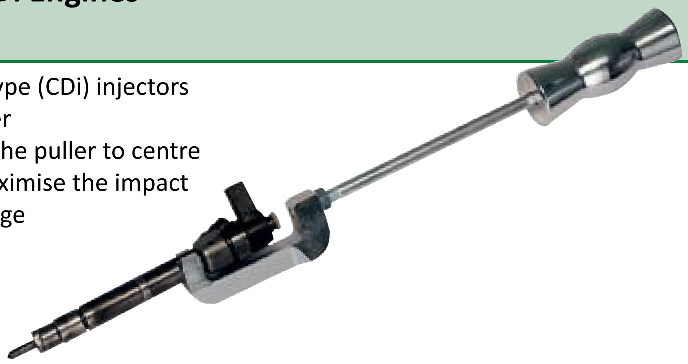
085700V2

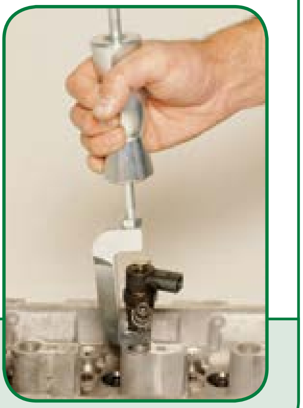
- For use with Lucas & Bosch type clamp-down injectors
- Slide hammer mechanism c/w M8, M12 & M14 adaptors
- Universal tool with a wide variety of Car, LCV & HGV applications
- Includes M17 adaptor for GM Vauxhall / Opel injectors (X20DTH / Y20DTH series engines)

Spare Parts:
- 08570370 - Adaptor M12 / M14
- 08570470 - Adaptor M8
- 08570770 - Adaptor M17

Injector Puller - Mercedes CDi Engines

08550000





- Injector puller designed for Bosch type (CDi) injectors
- Slide Hammer with special CDi puller
- Specially designed contact area on the puller to centre the impact of the slide hammer, maximise the impact force and minimise the risk of damage

Spare Parts:
- 08550170 - CDi Injector Puller
- 08550270 - Slide Hammer Assembly

Combined FSI / PD / Common Rail Injector Puller & Service Tool Kit for VW Group

08565000

Designed for the quick and safe extraction of injection nozzles and unit injector (PD) elements from diesel engines
- Suitable for VW, Audi, Seat and Skoda with direct injection engines and engines with pump-injector units
- For assembling and removal of FSI injectors
- Equivalent to VW OEM T10133 + T10163
- Knurled grips on the puller & assembling tools
- Packed in blow moulded case

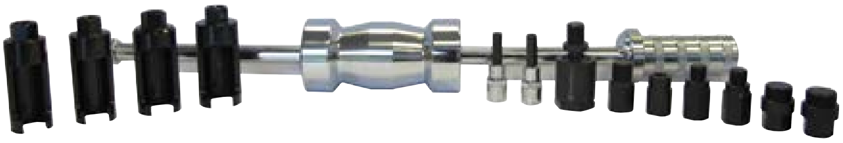
Applications:
- 1.4 SDI / TDI
- 1.9 D / SDI / TDI / TDI (PD)
- 2.0 TDI (PD) & (PD 4-Valves)
- 2.5 TDI / TDI (PD)
- 2.7
- 2.8 TDI (PD)
- 3.0 TDI (Common Rail)
- 4.2 TDI (Common Rail)
- 1.4, 1.6, 2.0, 3.0, 4.2 FSI

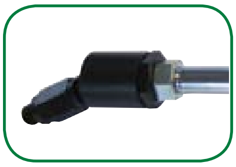
Spare Parts:
- 085650-01 - CRD Injector Removal Tool
- 085650-02 - PD Injector Removal Attachments
- 085650-03 - FSi Injector Removal Attachments
- 085650-04 - Teflon Seal Adaptors
- 085650-05 - Injector Re-fit Tool
- 085650-06 - Slide Hammer Kit

Heavy Duty Slide Hammer Injector Remover Kit

08585000

- Heavy Duty Slide Hammer puller for removal of Bosch, Delphi, Denso and Siemens injectors
- Features a flexible u-joint adaptor for access in restricted areas
- Contains:
  - 6 x Injector adaptors:
    M14 x 1.5, M16 x 1.0, M17 x 1.0, M20 x 1.0,
    M25 x 1.0, M27 x 1.0
  - 4 x Injector Solenoid removers:
    M25, M27, M29, M30
  - 2 x Nozzle Extractors:
    6mm Tamperproof: 10mm hex - 7mm Tamperproof: 10mm hex
- Heavy Duty Slide Hammer - Hammer Weight: 5.0kg (Total Weight: 8.0kg)
- Supplied in blow-moulded case





Spare Parts:

Injector Adaptors:
- 08581470 - M14 x 1.5
- 08581670 - M16 x 1.0
- 08581770 - M17 x 1.0
- 08582070 - M20 x 1.0
- 08582570 - M25 x 1.0
- 08582770 - M27 x 1.0

Flexible Adaptor:
- 08582870 - Flexible Adaptor

Injector Solenoid Removers:
- 01512500 - M25
- 01512700 - M27
- 01512900 - M29
- 01513000 - M30

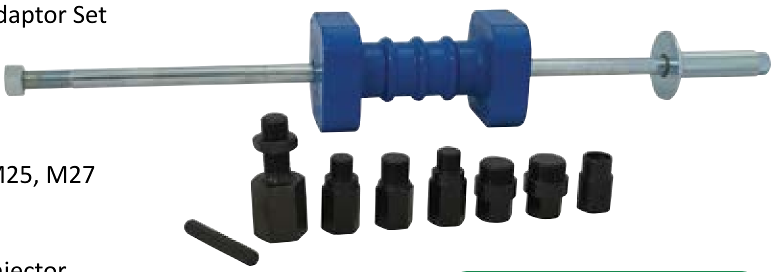
Nozzle Extractors:
- 08585670 - 6mm tamperproof - 10mm hex
- 08585770 - 7mm tamperproof - 10mm hex

- 08585870 - Slide Hammer Assembly

Diesel Injector Remover Kit For Common Rail Diesel Engines

08580000

- Heavy Duty Slide Hammer Kit c/w Injector Removal Adaptor Set
- Designed for use with Common Rail Diesel Engines
- Heavy Duty Slide Hammer (10lbs / 4.5kg) for fast and effective removal of stubborn injectors
- Contains:
  - Injector Removal Adaptors: M14, M16, M17, M20, M25, M27
  - Injector Dismantling Tool: M10 x 1/2” with hole
  - Slide hammer adaptor with locknut (M18)
  - Dismantling tool for removing internal parts of the injector where necessary
- Injector removal adaptors have a special hex design (M27) to allow use of an Impact Wrench to create vibration sufficient to break the injector seal
- Slide hammer adaptor has a 5/8” UNF internal thread for attaching to slide hammer shaft



Scan the QR code to watch a video of the Diesel Injector Remover Kit

N.B. 5/8”UNF is the thread pattern used on most SP slide hammer shafts and the majority of US market slide hammer shafts. Adaptor kit 08580500 (below) is for users who already possess a slide hammer with a 5/8”UNF threaded shaft.

Spare Parts:

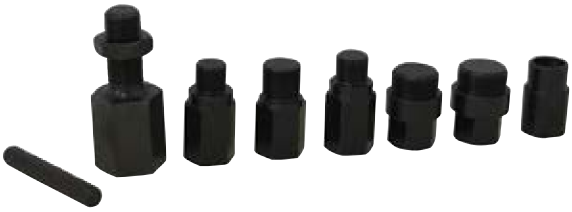
Injector Adaptors:
- 08581470 - M14 x 1.5
- 08582070 - M20 x 1.0
- 08581670 - M16 x 1.0
- 08582570 - M25 x 1.0
- 08581770 - M17 x 1.0
- 08582770 - M27 x 1.0

- 18580970 - Dismantling Tool

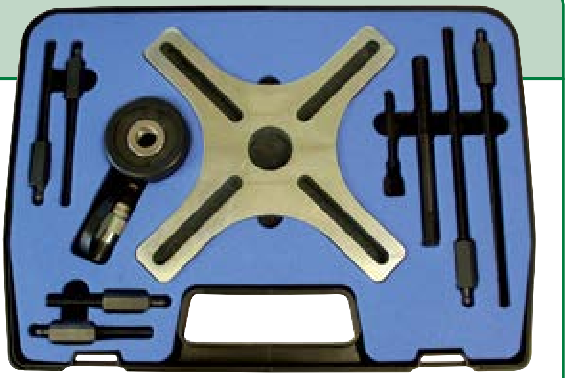
Injector Removal Set - Adaptor Kit only

08580500

- For use with an existing slide hammer with 5/8” UNF threaded shaft
- Contains:
  - Injector Removal Adaptors:
    M14, M16, M17, M20, M25, M27
  - Injector Dismantling tool:
    M10 x 1/2” with hole
  - Slide hammer adaptor with locknut (M18)



Hydraulic Injector Puller System Kit
18580000



- A unique concept for the removal of stubborn injectors
- Provides controlled force to aid the removal of seized injectors, where there is insufficient access for traditional slide hammers
- Uses a multi-position frame, with adjustable legs of different lengths, and a selection of mounting adaptors, to allow alignment of the tool with the injectors on a wide variety of modern diesel engines
- The combination of variable leg lengths, and selection of the appropriate adaptor for the cylinder head, allows the tool to be correctly positioned on most cylinder heads
- Supplied with injector adaptors for most modern injector types:
  M14, M16, M17, M20, M25, M27
- Includes instructional CD

Scan the QR code to watch a video of the Hydraulic Injector Puller System Kit

Spare Parts:

- 08581470 - M14 Injector Adaptor
- 08581670 - M16 Injector Adaptor
- 08581770 - M17 Injector Adaptor
- 08582070 - M20 Injector Adaptor
- 08582570 - M25 Injector Adaptor
- 08582770 - M27 Injector Adaptor
- 18580170 - Mounting Frame
- 18580270 - Support Legs 50mm (4)
- 18580370 - Support Legs 100mm (4)
- 18580470 - Support Legs 200mm (4)
- 18580570 - 17mm Hex Head Bolt Mountings (4)
- 18580670 - 19mm Hex Head Bolt Mountings (4)
- 18580770 - Concave Head Bolt Mountings (4)
- 18580870 - Tapered Cone Head Bolt Mountings (4)
- 18580970 - Hex Injector Strip Down Tool
- 18581070 - Centre Spindle Short M18
- 18581370 - Centre Spindle Long M18

M9R Renault Kit for Hydraulic Injector Puller (above)
18582500

- Useful additional plate and posts when working on M9R engines
- Allows direct application of pulling force
- Applications:
  Renault /
  Nissan / GM –
  Dci 2 litre engines (M9R)

PSA Adaptor Plate for Hydraulic Injector Puller (above)
18583000

- A bespoke add on kit for use on PSA 2.0 & 2.2 litre HDi diesel engines
- Allows precise and speedy set up ensuring correct tool alignment for the tricky task of injector release on troublesome engines
- Contents:
  - Plate and Support Legs

Hydraulic Hand Pump
20017000

- Lightweight aluminium bodied hand pump fitted with gauge, hydraulic hose and ¾" hydraulic coupler
- 2 Speed, 10,000psi
- Supplied in steel storage case

'Vibro-Impact' Air Hammer
90206000

- A unique concept to aid the removal of seized parts
- The 'Vibro-Impact' system allows for the controlled application of force via an air powered Impact Hammer
- Allows the operator to control and gradually increase the force being applied, in order to loosen seized components
- Ideal as a starting procedure before using the Hydraulic Injector Puller - 18580000 (above) as loosens carbon deposits around the injector

Refer to Page 133 for further details

Strap Type Oil Filter Remover - For all filters up to 300mm diameter

03860000

- Multi-purpose strap wrench, ideal for all oil filters up to 300mm circumference
- Range: 20 to 300mm diameter
- Strap Length: 1 metre long & 40mm wide
- Strong steel shank and polyester strap
- Self tightening band designed for fast and secure filter removal
- Double ended 13/16” hex c/w 3/8” & 1/2” sq. dr

Spare Parts:

- 03860500 – Replacement Strap

Heavy Duty Strap Wrench

015500V2

- Multipurpose, heavy duty strap wrench, ideal for HGV oil filter removal and industrial applications
- Range: 50 to 275mm diameter
- Strong cast iron handle for exerting high leverage, with polyester webbing strap

Spare Parts:

- 015512V2 - Replacement Strap

Adjustable Oil Filter Remover - 3 leg

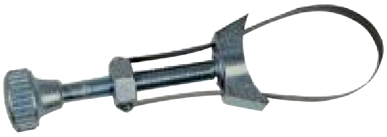
03810000

- Spider-type wrench, c/w geared legs which automatically tighten as the force is applied
- Range: 62 to 93mm diameter
- 3/8” sq. dr c/w with adaptor for 1/2 sq.dr. and/or 19mm hex

Adjustable Band Type Oil Filter Remover - LCV / HGV

03830000

- Band type, adjustable, non-stretch steel band with die-cast screw mechanism
- Range: 110 to 155mm diameter for LCV / HGV applications



Spare Parts:

- 03830100 – LCV / HGV Replacement Band

Adjustable Band Type Oil Filter Remover - Car / LCV

03840000

- Band type, adjustable, non-stretch steel band with die-cast screw mechanism
- Range: 66 to 100mm diameter for Car / LCV applications

Spare Parts:

- 03840100 – Car / LCV Replacement Band

Heavy Duty Chain Type Oil Filter Remover

03890000

- Heavy duty leaf type chain
- Range: 25 to 150mm diameter
- Ideal for HGV, plant and industrial applications, as well as Cars / LCV’s etc
- 1” hex or 1/2” sq. dr

Oil Filter Wrench - Belt Type

03875000

- Twist mechanism to adjust belt
- Range: 65 to 105mm diameter
- Soft grip handle

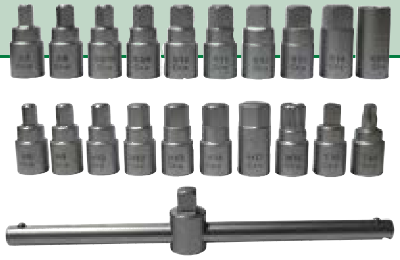
Low Profile Oil Filter Socket Set

03905000

- Set of six oil filter sockets covering a wide range of manufacturers including those fitted with Mann, Mahle and Knecht oil filters
- Chrome Vanadium sockets – 3/8 sq dr
- Includes sizes: 24, 27, 32, 36, 38, 42mm
- Applications include:
  BMW Mini, BMW, Mercedes-Benz A Class, Vauxhall Vectra 2.0, Astra-G, Corsa-B, Zafira, Ford, Volkswagen VR6, Audi
- VW Group diesel engines fitted with Mann, Mahle & Knecht filters

Sump Plug Key Set - 21 Piece

01485000



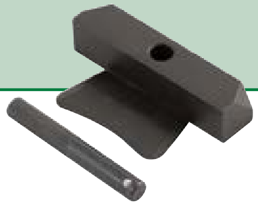
- Suitable for sump plug, engine, gear box, back axle applications
- Contents include:
  - 10mm (XS10) Square female (BMW, Ford, Renault, Toyota Gearbox / Differential)
  - M16 Spline tamperproof (VW Group Gearbox)
  - 10mm Triangular (Renault)
  - T45 Torx
- 3/8” sq drive c/w sliding T-Bar
- Supplied in moulded plastic case

Spare Parts:

- 014850-01 - 7mm square
- 014850-02 - 8mm square
- 014850-03 - 10mm square
- 014850-04 - 11mm square
- 014850-05 - 12mm square
- 014850-06 - 13mm square
- 014850-07 - 14mm square
- 014850-08 - 10mm square female
- 014850-09 - 5/16” square
- 014850-10 - 3/8” square
- 014850-11 - 8mm hex
- 014850-12 - 9mm hex
- 014850-13 - 10mm hex
- 014850-14 - 12mm hex
- 014850-15 - 13mm hex
- 014850-16 - 14mm hex
- 014850-17 - 17mm hex
- 014850-18 - M16 spline
- 014850-19 - 10mm triangular
- 014850-20 - T45 torx
- 014850-21 - 3/8” sq drive t-bar

Sump & Gasket Joint Separator

01487500

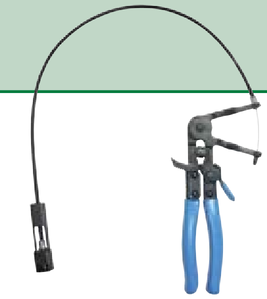


- Breaks seals on engine sumps, transmissions or any difficult to separate gasket joints easily
- Blade width 48mm – manufactured from specially hardened steel
- Insert the knurled handle into the separator and tap into joint with a hammer

Flexible Hose Clamp Tool

03240000

- Universal hose clamp tool for installation and removal of ‘elastic’ hose clamp collars
- Remote operation with rigid cable
- Suitable for self-tightening collars from 18 - 54mm (length)
- Patented micro-tooth ratchet and pawl mechanism



Heavy Duty Hose Clamp Plier

03250000

- Specially designed for releasing and refitting re-usable hose clips

Protective Seat Cover - Black

05162600

- 100% Nylon Seat Cover for protection of seats during service / maintenance work
- Grease and water resistant
- Fully washable
- Universal size - Fits most car / van seats

HYDRAULIC INJECTOR PULLER SYSTEM KIT

UNIQUE CONCEPT FOR THE REMOVAL OF STUBBORN INJECTORS

SEE PAGE 55

Tools

Repair Tools

BMW 2
MERCEDES 30

BMW

TB592800J	
Window Bars-Lift Suitable e.g. for Opel, Ford, DB, BMW etc.	Length: 300mm Height: 150mm Strength: 20mm

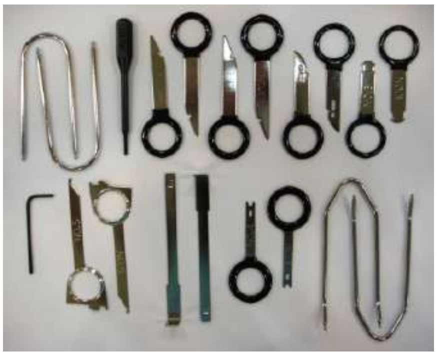
TB593500-10	**10Pc. Radio Removal Tool Set** Set includes the following tools needed to install and remove radios: * 2pc. Din Radio Removal U-Hooks (Ford/VW/Audi) * 1pc. Special Pentagon Wrench (BMW) * 2pc. Radio Removal Keys (New VW Beetle/Audi) * 2pc. Radio Removal Keys (Mercedes Benz) * 2pc. Radio Removal Keys (VW) * 1pc. Allen Hex Wrench (BMW)
RADIO REMOVAL TOOL KIT Ford VW Audi BMW New Beetle Audi Mercedes -Benz VW BMW	

TB593500-18	**18Pc. Radio Removal Tool Set** Set includes the following tools needed to install and remove radios: * 4pc. Radio Removal Keys (New VW Beetle/Audi) * 2pc. Radio Removal Keys (Mercedes Benz) * 2pc. Radio Removal Keys (VW) * 2pc. Radio Removal Keys (New Skoda) * 2pc. Radio Removal Keys (New Becker) * 2pc. Din Radio Removal U-Hooks (New Blaupunkt) * 1pc. Allen Hex Wrench (BMW) * 2pc. Din Radio Removal U-Hooks (Ford/VW/Audi) * 1pc. Special Pentagon Wrench (BMW)

TB593500-18A	**18Pc. Radio Removal Tool Set** Set includes the following tools needed to install and remove radios: * 4pc. Radio Removal Keys (New VW Beetle/Audi) * 2pc. Radio Removal Keys (Mercedes Benz) * 2pc. Radio Removal Keys (VW) * 2pc. Radio Removal Keys (New Skoda) * 2pc. Radio Removal Keys (New Becker) * 2pc. Din Radio Removal U-Hooks (New Blaupunkt) * 1pc. Allen Hex Wrench (BMW) * 2pc. Din Radio Removal U-Hooks (Ford/VW/Audi) * 1pc. Special Pentagon Wrench (BMW)

BMW

TB593500-20



20Pc. Radio Removal Tool Set

Set includes the following tools needed to install and remove radios:

* 4pc. Radio Removal Keys (New VW Beetle/Audi)
* 2pc. Radio Removal Keys (Mercedes Benz)
* 2pc. Radio Removal Keys (VW)
* 2pc. Radio Removal Keys (New Skoda)
* 2pc. Radio Removal Keys (New Becker)
* 2pc. Radio Removal Keys (Pioneer)
* 2pc. Din Radio Removal U-Hooks (New Blaupunkt)
* 1pc. Allen Hex Wrench (BMW)
* 2pc. Din Radio Removal U-Hooks (Ford/VW/Audi)
* 1pc. Special Pentagon Wrench (BMW)

TB593500-46

46Pc. Radio Removal Tool Set

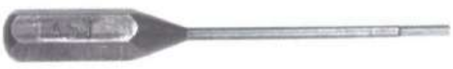
* 1 - 2 x KENWOOD II 1998-2001
* 2 - 2 x SONY II ab 2002
* 3 - 2 x KENWOOD III ab 2002
* 4 - 2 x PIONEER & JVC
* 5 - 2 x SONY I bis 2001
* 6 - 2 x PANASONIC
* 6A- 2 x PANASONIC 2006
* 7 - 2 x MERCEDES BENZ & BMW
* 8 - 2 x MERCEDES BENZ & BMW
* 9 - 2 x MERCEDES BENZ & BMW
* 10 - 2 x CLARION-NEU
* 11 - 2 x CLARION (ALT)
* 12 - 2 x FIAT BRAVA
* 13 - 2 x OPEL
* 14 - 2 x BLAUPUNKT, GRUNDIG, VW, AUDI, FORD
* 15 - 1 x BMW
* 16 - 4 x VW, AUDI, BECKER, MERCEDES BENZ
* 17 - 2 x BECKER, PORSCHE, MERCEDES BENZ
* 18 - 2 x VW
* 19 - 1 x BMW, OPEL-Inbus
* 20 - 2 x BECKER NEU ab 2002
* 21 - 2 x SKODA NEU ab 2002
* 22 - 2 x BLAUPUNKT NEU ab 2002

TB593500-46A

46Pc. Radio Removal Tool Set

* 1 - 2 x KENWOOD II 1998-2001
* 2 - 2 x SONY II ab 2002
* 3 - 2 x KENWOOD III ab 2002
* 4 - 2 x PIONEER & JVC
* 5 - 2 x SONY I bis 2001
* 6 - 2 x PANASONIC
* 6A- 2 x PANASONIC 2006
* 7 - 2 x MERCEDES BENZ & BMW
* 8 - 2 x MERCEDES BENZ & BMW
* 9 - 2 x MERCEDES BENZ & BMW
* 10 - 2 x CLARION-NEU
* 11 - 2 x CLARION (ALT)
* 12 - 2 x FIAT BRAVA
* 13 - 2 x OPEL
* 14 - 2 x BLAUPUNKT, GRUNDIG, VW, AUDI, FORD
* 15 - 1 x BMW
* 16 - 4 x VW, AUDI, BECKER, MERCEDES BENZ
* 17 - 2 x BECKER, PORSCHE, MERCEDES BENZ
* 18 - 2 x VW
* 19 - 1 x BMW, OPEL-Inbus
* 20 - 2 x BECKER NEU ab 2002
* 21 - 2 x SKODA NEU ab 2002
* 22 - 2 x BLAUPUNKT NEU ab 2002

TB595700



Special Allen Wrench

For R & R of all BMW anti-theft radios.

BMW

TB598200B	**Antenna Wrench & Radio Service Set** Set includes: * Universal Antenna Wrench * GM Code Retriever * Chrysler Radio Removal Socket * Ford Radio Removal Lock Pin Set * 1/4" Hex Bit Holder Socket * 1/4" Hex Torx Bits: T10 & T15 * 1/4" Hex Tamper Torx Bits: T7, T10, & T15 * BMW models with anti-theft radio. * Audi A4, A6, A8 and VW New Beetle. * For 1992 & newer Mercedes 129, 140, 163, 202, and 210 models. * For VW New Body Style Passat, Jetta and Golf.

TC59083	**BMW Ball Joint R&R; Tool BMW3028** Designed to remove or install the center ball joint of control arm. Used inconjunction with a hydraulic press. Or on the car application when used inconjunction with a C-Clamp. Applicable: Chassis -E30, E 36.

TC59093	**BMW E36 PRESS ARBOR KIT** CONTROL ARM/BALL JOINT TOOLS For removing and installing the outer wheel control arm ball joint. Use it together with C-Clamp(TW 35504 or OTC 7249) on the car, or with your hydraulic press. Applicable: E36 models.

TC59103	**BMW Press arbor Kit** Control arm Press Arbor Kit This set is used for the R &R; of control/track arm bushings. Used in conjunction with a hydraulic press. Applicable: BMW cassis E24 and E28.

BMW

TC59146A

26PC. Universal Radio Removal Kit & Antenna Wrench Kit

- * 4pc. Radio Removal Keys (New VW Beetle/Audi)
- * 2pc. Radio Removal Keys (Mercedes Benz)
- * 2pc. Radio Removal Keys (VW)
- * 2pc. Radio Removal Keys (New Skoda)
- * 2pc. Radio Removal Keys (New Becker)
- * 2pc. Din Radio Removal U-Hooks (New Blaupunkt)
- * 1pc. Allen Hex Wrench (BMW)
- * 2pc. Din Radio Removal U-Hooks (Ford/VW/Audi)
- * 1pc. Special Pentagon Wrench (BMW)
- * 7pc. Special Socket Set
- * 1pc. Chrysler Radio Removal Socket

TC59249

Wheel Bearing Tool Kit

(with mechanical drive)

Suitable for Fiat, VW-Audi, BMW, Ford, Seat, Skoda, Opel, etc.

For fast, safe and professional removal and installation of Wheel bearings.

The special design of pressure washers ensures safe and accurate centering of the wheel bearings and change that when removing and installing the wheel bearing only on the bearing outer ring and installation of the wheel hub pressed only on the bearing inner ring

is. This prevents damage to the new wheel bearing.

Through the combination of centering and pressure rings arise Pressure washers are precisely matched to the camp Ø can.

At very fixed or rusted wheel bearings can be optionally

A hydraulic 17 t. Drive can be used.

TC59257

BMW Outside Mirror Removal Pliers

Use to remove the retainer on the outside mirror.

•Applicable: BMW E12, E21, E23, E24, E28, E30, E31, E32, E34, E36, E38, E39.

LENGTH: 162 MM

TC59258A

Straight Socket 22mm hex

Application: VW-Audi, BMW, Mercedes, Ford, Opel/Vauxhall, Peugeot, Citroën, Renault, Seat, Skoda, Japanese cars, etc.

6*12-point: 22mm

Length: 250mm

Weight: 450g

TC59258A -1

Straight Socket 22mm hex

Application: VW-Audi, BMW, Mercedes, Ford, Opel/Vauxhall, Peugeot, Citroën, Renault, Seat, Skoda, Japanese cars, etc.

12*12-point: 22mm

Length: 250mm

Weight: 450g

TC59258B

Angled Socket 22mm hex

Application: VW-Audi, BMW, Mercedes, Ford, Opel/Vauxhall, Peugeot, Citroën, Renault, Seat, Skoda, Japanese cars, etc.

Angle bent at 30o

6*12-point: 22mm

Length: 250mm

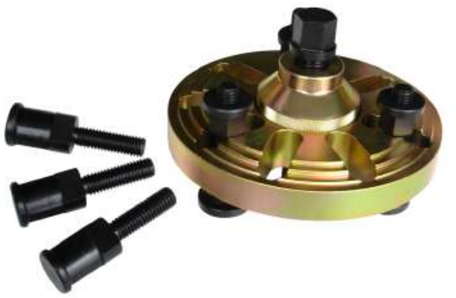
Weight: 450g

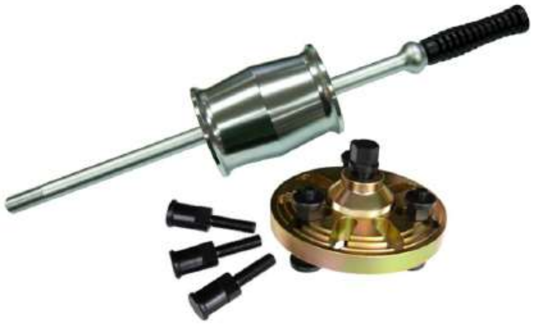
BMW

TC59258B-1	
Angled Socket 22mm hex Application: VW-Audi, BMW, Mercedes, Ford, Opel/Vauxhall, Peugeot, Citroën, Renault, Seat, Skoda, Japanese cars, etc. Angle bent at 30o 12*12-point: 22mm Length: 250mm Weight: 450g	

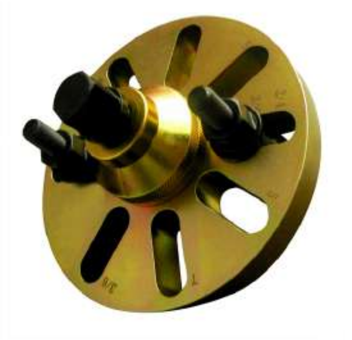
TC59316	
Oil and Diesel Oil Filter Wrench 14 sides Ø: 74mm H: 68mm Application: Toyota/Lexus, VW-Audi, Ford, BMW, Opel, Mercedes-Benz, Peugeot, Citroen, Renault, Mazda, etc...	

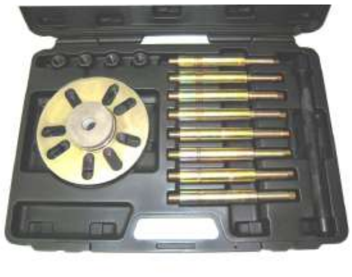
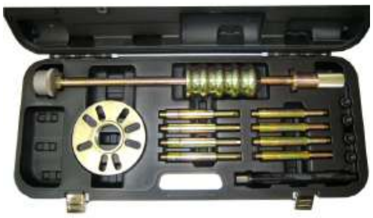
TC59258B-1_970	**Angled Socket 22mm hex** Application: VW-Audi, BMW, Mercedes, Ford, Opel/Vauxhall, Peugeot, Citroën, Renault, Seat, Skoda, Japanese cars, etc. Angle bent at 30o 12*12-point: 22mm Length: 250mm Oxygen Sensor Wrench Needed for servicing today's computer-controlled vehicle systems. Easily removes the oxygen sensor located in the exhaust manifold. Heat treated cast steel. Has 7/8" hex, 1/2" square drive (double square for easy access).

TC59317A	**Pulley-Extractor and Reaction Tool** Universal application： VW-Audi, Seat, Škoda, Opel/Vauxhall Ford, BMW, Mercedes, Peugeot, Citroën, Renault, Fiat, Japanese vehicles, etc. Loosen the retaining bolt and extract the Pulley. Suitable for all Pulleys with holes with a PCD Ø from 70 mm - 100 mm. Suitable for hole Ø from minimum 20 mm. To lock the Pulley while loosening or tightening the retaining bolt, as well as preventing the Pulley from rotating duringextraction. Any available ½“ ratchet or extension drive may be used as the reaction tool. Consists of: * 1 x Puller Plate * 3 x Hook Ø 20 mm * 3 x Hook Ø 26 mm * 3 x Shoulder Nut M10 * 1 x Pressure-Unit
	

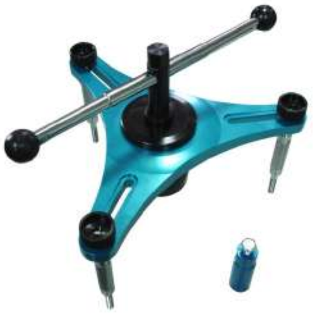
TC59317A-HM	**Pulley-Extractor and Reaction Tool** Universal application： VW-Audi, Seat, Škoda, Opel/Vauxhall Ford, BMW, Mercedes, Peugeot, Citroën, Renault, Fiat, Japanese vehicles, etc. Loosen the retaining bolt and extract the Pulley. Suitable for all Pulleys with holes with a PCD Ø from 70 mm - 100 mm. Suitable for hole Ø from minimum 20 mm. To lock the Pulley while loosening or tightening the retaining bolt, as well as preventing the Pulley from rotating duringextraction. Any available ½“ ratchet or extension drive may be used as the reaction tool. Consists of: * 1 x Puller Plate * 3 x Hook Ø 20 mm * 3 x Hook Ø 26 mm * 3 x Shoulder Nut M10 * 1 x Pressure-Unit * 1x Hammer (L=495mm)
	

BMW

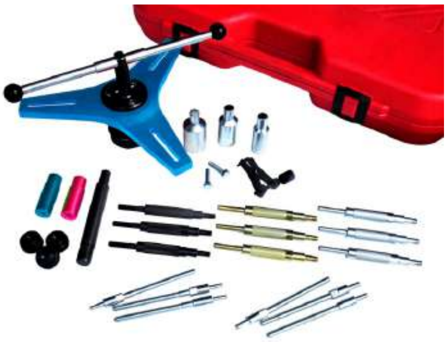
TC59317B	**Pulley-Extractor and Reaction Tool** As TC59317A Pulley-Extractor and Reaction Tool but with 2 Hooks Ø- 26 mm and 2 Hexagonal Nuts . Suitable for VW-Audi, Seat, Škoda, Opel/Vauxhall Ford, BMW, Mercedes, Peugeot, Citroën, Renault, Fiat, Japanese vehicles, etc. Consists of: * 1 x Puller Plate * 2 x Hook Ø 26 mm * 2 x Shoulder Nut M10 * 1 x Pressure-Unit
	

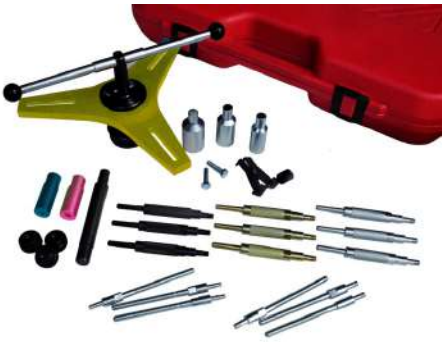
TC59317D		TC59317D (SET)	
Puller Set Suitable for : VW-Audi, Alfa Romeo, BMW, Citroën, Fiat Ford, Mazda, Mercedes, Opel, Porsche, Renault, Seat, Škoda, etc.		**Puller Set & Slide Hammer** Suitable for : VW-Audi, Alfa Romeo, BMW, Citroën, Fiat Ford, Mazda, Mercedes, Opel, Porsche, Renault, Seat, Škoda, etc.	

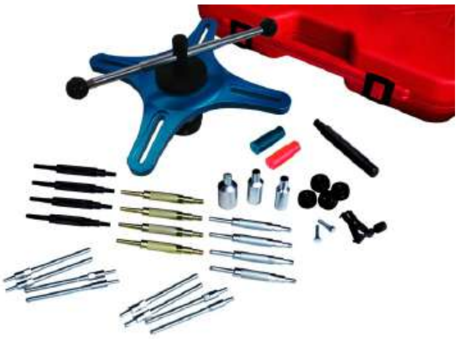
TC59317D-HM	**Slide Hammer** Weight: 4.8 kg Suitable for : VW-Audi, Alfa Romeo, BMW, Citroën, Fiat Ford, Mazda, Mercedes, Opel, Porsche, Renault, Seat, Škoda, etc.

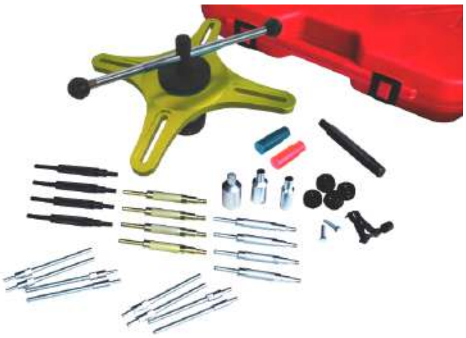
TC59388	**Self Adjusting Clutch Assemble Tool** For removal and installation of self adjusting clutches fitted to BMW/VAG/Mercedes/Volvo/ Renault/Vauxhall/Opel. The tool allows the clutch pressure plate to be pretension prior to removal and installation, avoiding distortion to the plate. The tool also allows the clutch plate to be centred accurately on the guide bearing or pressure plate and the adjusting ring rewound. ·Material：Aluminum.
	

BMW

TC59388-30	**Complete Kit For Assembling And Disassembly Of Self Adjusting Clutches**
	(3 hole pitch) Suitable for most Self Adjusting Clutches SAC(3 holes) equipped on vehicles of FIAT GROUP, VW-AUDI, BMW, MERCEDES, VOLVO, OPEL, RENAULT etc. Allows operations on clutch equipped with this device in order to prevent any damage to system and to keep adapter ring in right position. Advantages： ·Pre-tightening of disk pushing plate during assembly and disassembly avoiding clutch deformation. ·Alignment of clutch disk to drive bearing or to disk pushing plate. ·Material：Aluminum.

TC59388-30A	**Complete Kit For Assembling And Disassembly Of Self Adjusting Clutches**
	(3 hole pitch) Suitable for most Self Adjusting Clutches SAC(3 holes) equipped on vehicles of FIAT GROUP, VW-AUDI, BMW, MERCEDES, VOLVO, OPEL, RENAULT etc. Allows operations on clutch equipped with this device in order to prevent any damage to system and to keep adapter ring in right position. Advantages： ·Pre-tightening of disk pushing plate during assembly and disassembly avoiding clutch deformation. ·Alignment of clutch disk to drive bearing or to disk pushing plate. ·Material：Steel.

TC59388-40	**Complete Kit For Assembling And Disassembly Of Self Adjusting Clutches**
	(4 hole pitch) Suitable for most Self Adjusting Clutches SAC(4 holes) equipped on vehicles of FIAT GROUP, VW-AUDI, BMW, MERCEDES, VOLVO, OPEL, RENAULT etc. Allows operations on clutch equipped with this device in order to prevent any damage to system and to keep adapter ring in right position. Advantages： ·Pre-tightening of disk pushing plate during assembly and disassembly avoiding clutch deformation. ·Alignment of clutch disk to drive bearing or to disk pushing plate. ·Material：Aluminum.

TC59388-40A	**Complete Kit For Assembling And Disassembly Of Self Adjusting Clutches**
	(4 hole pitch) Suitable for most Self Adjusting Clutches SAC(4 holes) equipped on vehicles of FIAT GROUP, VW-AUDI, BMW, MERCEDES, VOLVO, OPEL, RENAULT etc. Allows operations on clutch equipped with this device in order to prevent any damage to system and to keep adapter ring in right position. Advantages： ·Pre-tightening of disk pushing plate during assembly and disassembly avoiding clutch deformation. ·Alignment of clutch disk to drive bearing or to disk pushing plate. ·Material：Steel.

BMW

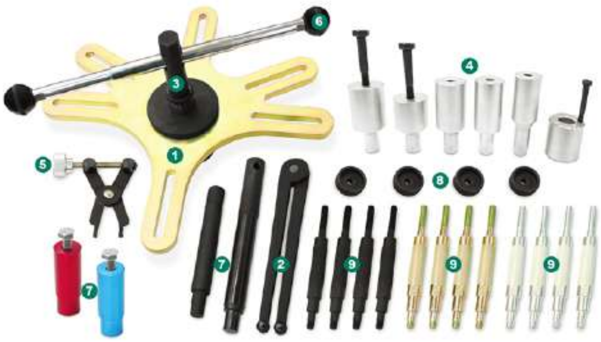
TC59388-3040	**Complete Kit For Assembling And Disassembly Of Self Adjusting Clutches** (3 and 4 hole pitch) Suitable for most Self Adjusting Clutches SAC(3 and 4 holes) equipped on vehicles of FIAT GROUP, VW-AUDI, BMW, MERCEDES, VOLVO, OPEL, RENAULT etc. Allows operations on clutch equipped with this device in order to prevent any damage to system and to keep adapter ring in right position. Advantages： ·Pre-tightening of disk pushing plate during assembly and disassembly avoiding clutch deformation. ·Alignment of clutch disk to drive bearing or to disk pushing plate. ·Material：Aluminum.

TC59388-3040A	**Complete Kit For Assembling And Disassembly Of Self Adjusting Clutches** (3 and 4 hole pitch) Suitable for most Self Adjusting Clutches SAC(3 and 4 holes) equipped on vehicles of FIAT GROUP, VW-AUDI, BMW, MERCEDES, VOLVO, OPEL, RENAULT etc. Allows operations on clutch equipped with this device in order to prevent any damage to system and to keep adapter ring in right position. Advantages： ·Pre-tightening of disk pushing plate during assembly and disassembly avoiding clutch deformation. ·Alignment of clutch disk to drive bearing or to disk pushing plate. ·Material：Steel.

TC59388-ST	**Self Adjusting Clutch Assemble Tool** For removal and installation of self adjusting clutches fitted to BMW/VAG/Mercedes/Volvo/ Renault/Vauxhall/Opel. The tool allows the clutch pressure plate to be pretension prior to removal and installation, avoiding distortion to the plate. The tool also allows the clutch plate to be centred accurately on the guide bearing or pressure plate and the adjusting ring rewound. ·Material：Steel.

BMW

TC59388E



SAC Clutch Tool Master Kit

- This kit allows the professional dismounting and mounting of all self adjusting clutches (SAC) e.g. on VW, Audi, BMW, Ford, Mercedes-Benz, Opel, Renault, Volvo, etc.
- During assembling and disassembling operations the pre-tightening of the pressure plate is required in order to avoid cluctch deformation.
- The 6-arms plate has been designed for use with 3 and 4 fixing points, for clutches with 6 or 8 locking holes.

1. Clamping tool for SAC clutches with 6(8) locking holes
2. Face spanner
3. Compression strut
4. Clutch mandrel set (BMW)
   - (a) 15mm x 23mm
   - (b) 15mm x 26.5mm
   - (c) 15mm x 28mm
   - (d) 15mm x 32.5mm
   - (e) 15mm x 34mm
   - (f) Centering sleeve (15mm / 32.5mm)
5. Clutch resetting tool
6. Handle for clamping tool (2pcs)
7. Clutch centering tools
   - (a) Blue: 19.75mm diameter
   - (b) Pink: 20.75mm diameter
   - (c) Black stepped: 19mm/15mm/14mm
   - (d) Black stepped: 22mm/20mm/15mm(VW)
8. Knurled nuts for threaded bolts (4 pcs)
9. 3 sets of 4 threaded bolts
   - (a) Silver: M6 / 1.0 screw thread
   - (b) Black: M8 / 1.25 screw thread
   - (c) Gold: M7 / 1.0 screw thread

TC59388F

SAC Clutch Mandrel Set (BMW)

Suitable for BMW vehicles

- For centering clutch disc on flywheel while installing self adjusting clutch (SAC).
- Designed to align the clutch disc before installing or re-installing a self adjusting clutch (SAC).
- Can also be used to align new and already pretensioned SAC clutches.

BMW

TC59433B

Stretch Belt Installation Tools
Quickly and easily install stretch belt found on many late model vehicles. These drive systems do not have a tensioner and require the proper installation tools to avoid damage to belts.

Applications :
BMW, Volvo,Mercedes,Mazda

TC59437B

Oil Pan Repair Master Set
*Feature: Solid and fast solution for the repair of defective oil drain screw thread without the expensive replacement of the sump.
*Application: The damaged thread is simply to tap away to the next size expands. Oil drain screw in part with Allen drive for oil pans with recessed drain opening suitable.
*Universal applications e.g. for: Audi, BMW, Citroen, Daimler-Benz, Ford, Fiat, Honda, Mazda, Mitsubishi, Nissan, Opel, Peugeot, Porsche, Renault, Saab, Seat, Skoda, Toyota, Volvo, VW etc.
*Scope of supply: complete with 1 / 3 foam insert in the plastic case. Replacement oil drain screw and aluminum seals are available.
*Consisting of:
1─Special Taps M13x1.5
1─Special Taps M15x1.5
1─Special Taps M17x1.5
1─Special Taps M20x1.5
5─Oil drain plug gasket with aluminum M13x1.5 external drive 6-kant SW17
5─Oil drain plug gasket with aluminum M15x1.5 external drive 6-kant SW19
5─Oil drain plug gasket with aluminum M17x1.5 inner drive 6-kant SW 8
5─Oil drain plug gasket with aluminum M20x1.5 inner drive 6-kant SW 10

TC59447

Oil Cooler Line Plier
Release the hydraulic cooling lines that connect to the transmission.
• Applications: BMW E46, E53, E65, E66, E85, R50, R53.

BMW

TC59460A

Brake Cable Pliers

To remove and replace the Hand Brake Cable . The Pliers compress the return springs so far that the cable may be easily removed and replaced.

Suitable for VW, Audi, BMW, Nissan, Peugeot, Renault, Rover, Seat, etc.

Length: 225 mm

TC59467

Universal Valve Spring Compressor Tool

Applicable for 1-12 cylinder engines -two up to four - valve technology, in-line-engines or V-engines.

- This tool permits renewal of valve-stem oil-seals with the cylinder head removed or cylinder head assembled.
- The retaining flanges are rotatable, so that they may be affixed to the cylinder head lengthways, sideways, or diagonally.
- The correct height of the supporting rod may be adjusted due to the adjustment spindles on the left and right side, to achieve the correct angle between handle and the pressure piece for compressing the valve-spring.
- Moveable rests allow infinitely adjustment of the tool length and therefore an universal application for 1-12 cylinder engines

Press Piece

21mm	Peugeot; Citroen HDI
24mm	VW/Audi; Seat; Smart & Opel
25mm	Hyundai
28mm	Toyota & Ford 16V
32mm	Opel & Peugeot
34mm	BMW; VW & Peugeot (diesel)
35mm	Renault; Mazda; Peugeot 106 & Mercedes M102/ M104
42mm	Ford

BMW

TC59467A

Universal Valve-Spring Compressor Tool
1-Adaptor
8-Valve Caps：
Ø21-24-25-28-32-34-35-42MM

Press Piece

21mm	Peugeot; Citroen HDI
24mm	VW/Audi; Seat; Smart & Opel
25mm	Hyundai
28mm	Toyota & Ford 16V
32mm	Opel & Peugeot
34mm	BMW; VW & Peugeot (diesel)
35mm	Renault; Mazda; Peugeot 106 & Mercedes M102/ M104
42mm	Ford

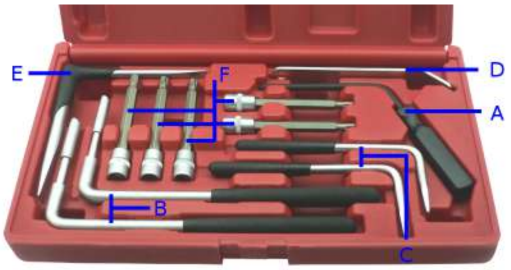
TC59476

Driveshaft Tie Pliers
Applicable on Audi, BMW, Chrysler, Ford, GM, Honda, Mazda, Mercedes, Nissan, Opel/Vauxhall, VW, etc.
* For crimping driveshaft bellows ties.
* Suitable for Oetiker fittings.

TC59497

7Pc. Air Bag Removal Tool Kit
A seven piece tool kit for removing air bags on Volkswagen/Audi, BMW and Mercedes.

TC59497-12

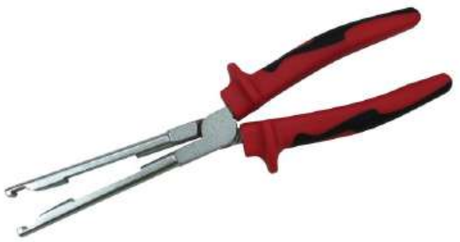


12Pc. Universal Tool For Expanding Air Bag Set
For the safe removal and installation of air-bag units in many popular cars

		Manufacturer	Model
A	Drivers Air Bag(x1)	Volkswagen	Passat, Jetta, Golf, Beetle, Bora
B	(x2)	Volkswagen, Audi, Skoda	Passat B5, Polo, Lupo, A4&A6;, Superb
C	(x2)	Volkswagen, Seat, Skoda	Golf F4, New Beetle , Fabla, Octavia
D	(x1)	Volkswagen	Golf F4, Passat, Bora
E	(x1)	Volkswagen	Passat
F	T30(x2)	Audi, Opel, Renault, VW, BMW, Mercedes, Opel	
F	T25(x2)	BMW	
F	5MM(x1)	Audi	

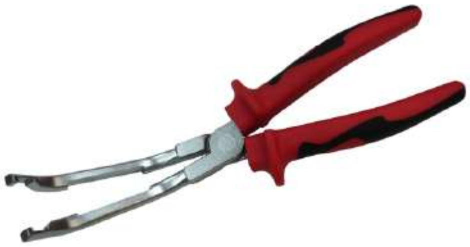
BMW

TC59548



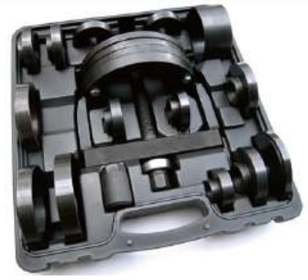
Glow-Plug Connector Pliers(straight)
To remove stubborn and awkward to reach Glow-Plug connectors, found on the latest generation of engines. e.g. Mercedes, BMW, VW-Audi etc.

TC59558



Glow-Plug Connector Pliers(angled)
To remove stubborn and awkward to reach Glow-Plug connectors , found on the latest generation of engines.
e.g. Mercedes, BMW, VW-Audi etc.
* Version angled at 90°

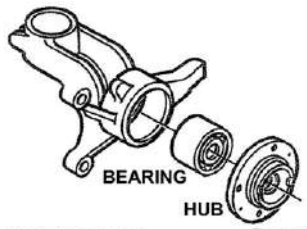
TC59593



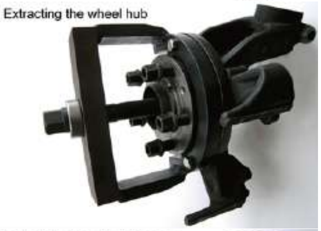
Wheel Hub and Bearing Master Kit

The TC59593 is the only equipment designed to accurately and efficiently Extract or Install Hubs and singular Wheel Bearings of spindle assemblies. It will tackle Front, Rear or All Wheel Drive vehicles with independent suspension and equipped with a solid roller ball bearing. The application is strictly for wheel assemblies where power is applied from the motor to the wheels, equipped with independent suspension and use a Singular Solid Roller Bearing at that wheel. It's unit on the market to "track arrow straight" when properly assembled on the vehicle under load. It tackles most front wheel drive Asian, European, and some Domestic vehicles and within its exclusive design the only unit to tackle Rear wheel drive European vehicles.
Applicable:
Rear Wheel Drive = BMW, Mercedes, Porsche.

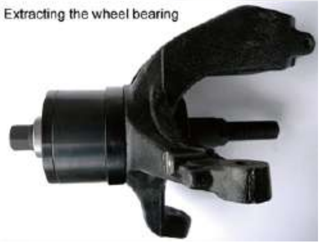
Front Wheel Drive =
European - VW, Audi.
American - Chrysler, Ford, Saturn
Asian - Toyota / Lexus, Nissan / Infiniti, Honda / Acura, Mazda, Hyundai / Kia



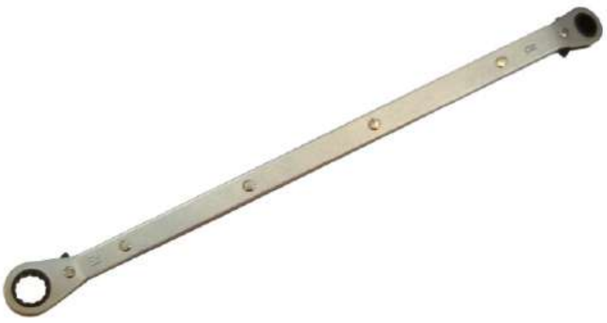
Extracting the wheel hub



Extracting the wheel bearing



TC59606-810



Double Offset Ratchet Wrench
* For installing and removing glow plugs e.g. on diesel engines VW, BMW, AUDI, RENAULT.
* For glow plugs between the motor unit and the diesel injection pump.
* Heads with hexagon profile.

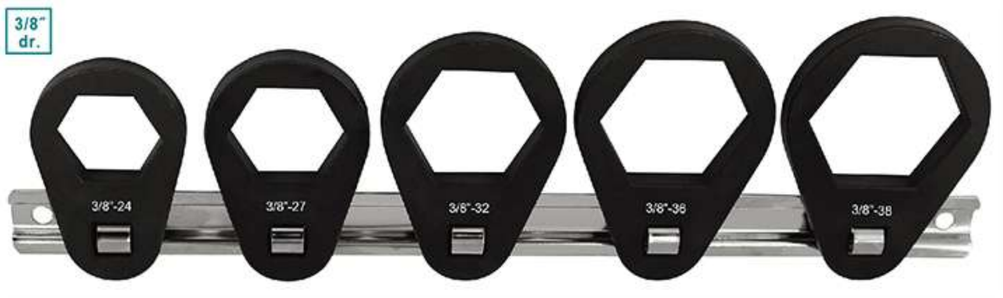
TC59606-810 8mm x 12PT x 10mm x 12PT x 300 mm Long.
* s 8 mm for operation of conductor rail screws with limit stop to guide the 8 mm nut.
* s 10 mm for the operation of glow plugs.

BMW

TC59606-812	**Double Offset Ratchet Wrench** * For installing and removing glow plugs e.g. on diesel engines VW, BMW, AUDI, RENAULT. * For glow plugs between the motor unit and the diesel injection pump. * Heads with hexagon profile. TC59606-812 8mm x 12PT x 12mm x 12PT x 300 mm Long. * s 8 mm for operation of conductor rail screws with limit stop to guide the 8 mm nut. * s 12 mm for the operation of glow plugs.

BMW

TC59663



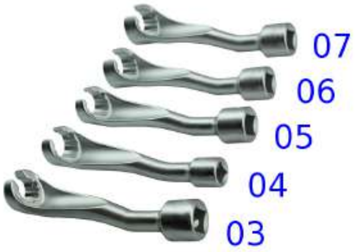
Oil Filter Offset Wrench Set (5pcs)

Features:
- 24mm/27mm/32mm/36mm/38mm with 3/8" square driver .
- Low profile design with offset drive.
- Special design for tight confined areas.
- For oil filters where access is limited.

Size	Brand	Model
24mm	BMW	N62 5/7 Series
27mm	Mercedes-Benz	A-Class
27mm	Ford	Fiesta 1.4/1.6 TDCi
27mm	Renault	1.5/1.9/2.2/2.5dci
27mm	BMW	Mini
27mm	Ford	Transit 2.2/2.4/3.2
32mm	Vauxhall/Opel	Astra-G/Corsa-B
32mm	Volkswagen	Polo 1.2/Transporter T5 1.9
32mm	Audi	A6 3.2 TSi V6
32mm	Ford	Transit 2.0/2.4
32mm	Chevrolet	HHR/Cobalt/Cobalt SS/Malibu/Cavalier/S10/Malibu, Maxx
32mm	Saturn	L-series/lon/Vue
32mm	Pontiac	G6/Solstice/Sunfire/Grand AM
32mm	Oldsmobile	Alero
32mm	GMC	Sonoma
32mm	SAAB	9-3
36mm	Mercedes-Benz	220d/E220d/M604/C250d/E250d/M605/E300d/M606 MB/MB Transporter M616 116MB/100 Transporter
36mm	BMW	M52 3 Series/5 Series M60 6cyl/5/7/8 Series M73 12 cyl 7/8 Series
36mm	Vauxhall/Opel	Vectra-B di 16v
36mm	Volkswagen	Transporter T5/Lupo 1.2 TDi/Toureg TDi
38mm	Vauxhall/Opel	Astra | Zafira 2.0/2.2 dti

BMW

TC59697D



Injection Line Socket

•Open 12-point socket for the operation of screwed connections on injection lines.

• On MAN commercial vehicles with D 20 engines – Common Rail injection systems.

Part No.	Drive	S*L(mm)	Description
TC59697D-03	3/8" □	17*115	For BMW diesel engines and OPEL 2.5TD engines
TC59697D-04	1/2" □	14*119	For injection lines e.g. on BMW, VW
TC59697D-05	1/2" □	17*119	• For injection lines on MERCEDES-BENZ 100, 130, 314, 360, 360h, 352a, 346/355, 401, 402, 403, 407h, 615, 616, 617 • Long style
TC59697D-06	1/2" □	19*119	• For injection lines on MERCEDES-BENZ M 352, A, 346/355, A ,401, 402/422, LA, 403, 407h, as well as for the dip stick guide tube on M 314 • Long style
TC59697D-07	1/2" □	18*119	For All diesel engines

TC59697D-3PCS

Injection Line Socket

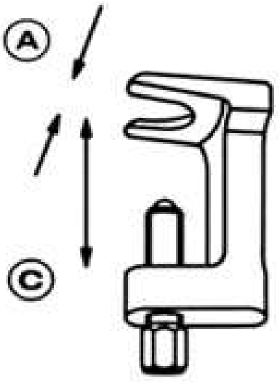
•Open 12-point socket for the operation of screwed connections on injection lines.

• On MAN commercial vehicles with D 20 engines – Common Rail injection systems.

Part No.	Drive	S*L(mm)	Description
TC59697D-04	1/2" □	14*119	For injection lines e.g. on BMW, VW
TC59697D-05	1/2" □	17*119	• For injection lines on MERCEDES-BENZ 100, 130, 314, 360, 360h, 352a, 346/355, 401, 402, 403, 407h, 615, 616, 617 • Long style
TC59697D-06	1/2" □	19*119	• For injection lines on MERCEDES-BENZ M 352, A, 346/355, A ,401, 402/422, LA, 403, 407h, as well as for the dip stick guide tube on M 314 • Long style

BMW

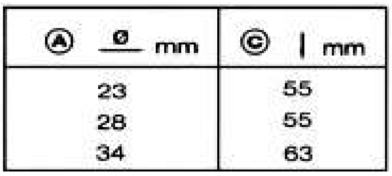
TC59710



Ball Joint Extractor Set

For Audi, BMW, Ford, Chrysler, Opel, Saab, Volvo, VW, Nissan, Toyota....

TC59710A
TC59710B
TC59710C



Ⓐ ø mm	Ⓒ | mm
23	55
28	55
34	63

TC59797

Diesel Injector Seat Cutter Set

- •Identify injector "blow-by" exists (see previous page for possible symptoms).
- •Gain access to the injectors and remove them.
- •Select required reamer onto pilot post and tighten internal hex screw.
- •Place assembled cutter into injector recess.
- •Using the T bar and socket supplied apply only a small amount of pressure whilst turning the cutter in a clockwise direcyion only. Use a small amount of light lubricant whilst performing the cut to reduce chattering and help give a flat cut. Do not over cut the seat only remove enough metal to form a good seat.
- •Thoroughly clean the seat and remove all swarf.
- •Fit injectors as per manufacturers instructions.

Kit contents:

- •TC59797-01-15*19mm Flat Reamer for Universal injector.
- •TC59797-02-17*17mm Flat Reamer for Delphi/Bosch injectors (BMW/PSA/Renault/Ford).
- •TC59797-03-17*19mm Flat Reamer for Bosch injectors (Mercedes CRD).
- •TC59797-04-17*21mm Angled Resmer for Fiat/Iveco.
- •T handle*1.
- •Pilot post*1.

MATERIAL：CR-V

TC59797-5

Diesel Injector Seat Cutter Set

- •Identify injector "blow-by" exists (see previous page for possible symptoms).
- •Gain access to the injectors and remove them.
- •Select required reamer onto pilot post and tighten internal hex screw.
- •Place assembled cutter into injector recess.
- •Using the T bar and socket supplied apply only a small amount of pressure whilst turning the cutter in a clockwise direcyion only. Use a small amount of light lubricant whilst performing the cut to reduce chattering and help give a flat cut. Do not over cut the seat only remove enough metal to form a good seat.
- •Thoroughly clean the seat and remove all swarf.
- •Fit injectors as per manufacturers instructions.

Kit contents:

- •TC59797-01-15*19mm Flat Reamer for Universal injector.
- •TC59797-02-17*17mm Flat Reamer for Delphi/Bosch injectors (BMW/PSA/Renault/Ford).
- •TC59797-03-17*19mm Flat Reamer for Bosch injectors (Mercedes CRD).
- •TC59797-04-17*21mm Angled Reamer for Fiat/Iveco.
- •TC59797-05-17mm Angled for Fiat/Iveco, Ford
- •T handle*1.
- •Pilot post*1.

MATERIAL：CR-V

BMW

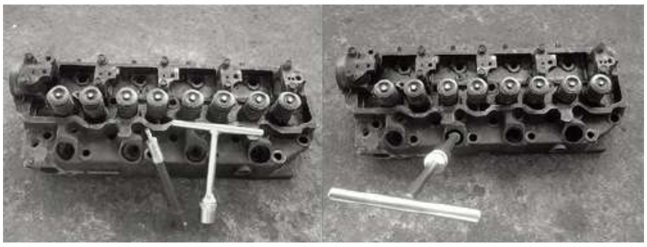
TC59797-8

Diesel Injector/Injector Seat Cleaner Set

Used to clean injector / injector seat when changing injector. Helps to avoid blow - back due to poorly seated injector. Suitable for a wide range of vehicles.

Content

Pilot post		
T-handle		
Reamer (flat)	15 x 19 mm	Various vehicles
Reamer (flat)	17 mm	Bosch / Delphi (BMW, Ford, PSA, Renault)
Reamer (flat)	17 x 19 mm	Bosch (Mercedes CRD)
Reamer (angled)	17 mm	Fiat, Iveco, Ford, Mercedes CDI
Reamer (angled)	17 x 21 mm	Fiat, Iveco
Reamer	18 x 21 mm	Various vehicles
Reamer	20 x 21 mm	Various vehicles
Reamer (long)	15.5 mm	Bosch
Cleaner	19 mm	Injector cleaner
Hex key		



TC59797AA

Diesel Injector Seat Cutter Set

- •Identify injector "blow-by" exists (see previous page for possible symptoms).
- •Gain access to the injectors and remove them.
- •Select required reamer onto pilot post and tighten internal hex screw.
- •Place assembled cutter into injector recess.
- •Thoroughly clean the seat and remove all swarf.
- •Fit injectors as per manufacturers instructions.

Kit contents:

- •15*19mm Flat Reamer for Universal injector.
- •17*17mm Flat Reamer for Delphi/Bosch injectors (BMW/PSA/Renault/Ford).
- •17*19mm Flat Reamer for Bosch injectors (Mercedes CRD).
- •17*21mm Angled Resmer for Fiat/Iveco.
- •Pilot post*1.

TC59797AA-5

Diesel Injector Seat Cutter Set

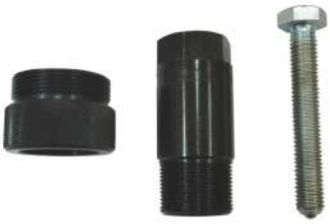
- •Identify injector "blow-by" exists (see previous page for possible symptoms).
- •Gain access to the injectors and remove them.
- •Select required reamer onto pilot post and tighten internal hex screw.
- •Place assembled cutter into injector recess.
- •Thoroughly clean the seat and remove all swarf.
- •Fit injectors as per manufacturers instructions.

Kit contents:

- •15*19mm Flat Reamer for Universal injector.
- •17*17mm Flat Reamer for Delphi/Bosch injectors (BMW/PSA/Renault/Ford).
- •17*19mm Flat Reamer for Bosch injectors (Mercedes CRD).
- •17*21mm Angled Resmer for Fiat/Iveco.
- •17mm Angled for Fiat/Iveco, Ford
- •Pilot post*1.

BMW

TC59808	**Earless Clamp Pliers-Extra Heavy Duty** For tightening of clamps (system OETIKER) on cv boots, water and fuel hoses. Suitable for Audi, BMW, Chrysler, Ford, GM, Honda, Mazda, Mercedes, Nissan, Opel/ Vauxhall, VW etc. Advantages: * No damage to spring band clamps. * No damage to hoses. * Easy and quick replacement of hoses.

TC59818B	
Diesel Injection Pump Remover & Sprocket Retainer - BMW M47/M57 Removes the diesel pump and retains the pump sprocket in-situ so that the sprockets/timing chain configuration remains undisturbed, minimising the level of engine disassembly.	

TC59820	**Needle Bearing Extractor Sets** Also for ball bearing and bushings. For bores: dia. 12, 15, 18 mm. For cars: Audi, BMW, Citroen, Fiat, Ford, DB, Opel, Peugeot, Porsche, Renault, Rover, Saab, Volvo, VW, Nissan, Datsun, Toyota... Contents: Pair of legs, 3 distance wedges, 1 slide hammer with holder. 12mm for BMW, Opel 15mm for Audi, DB, Ford, Opel, Porsche, VW 18mm for Audi

TC59825	**Wiper-Arm Puller Set** Suitale for: VW-Audi, BMW, Ford, Mercedes, Opel, Peugeot, etc. The first universal Puller Set to remove bolted Windscreen Wiper Arms, especially for those which have become rusted or corroded onto the drive-shaft. Stubborn and deep-seated Wiper Arms may be quickly and easily removed using the TC59825 Puller Set. Wiper Arms with integrated Screen-Wash nozzles - e.g. VW-Audi, BMW etc. on the rear window - can be easily removed by using the Slide hammer included in the Set. Wiper Arms with central holes may be removed by using the Pressure Spindle. Those Wiper Arms with no central hole require the Pressure Bolt to be used with the Pressure Adaptor supplied. Contents: * 6 grippers * 1 Pressure spindle * 1 slide hammer

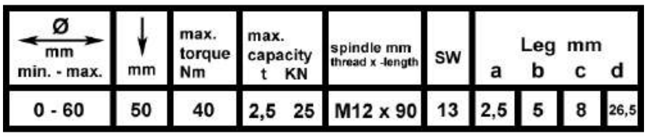
BMW

TC59825A

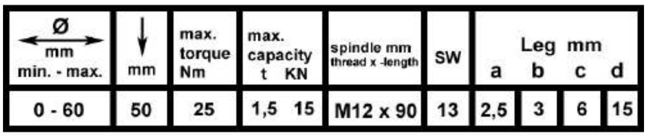
Universal Windscreen Wiper Arm Puller Set
for cars and trucks
Contents:
* 8 grippers
* 1 drive
* 1 spindle-cap
* 1 hollow-cap
* 1 spindle-extension
* 1 puller
* 2 special-legs
* 1 slide hammer
Cars: Audi, Alfa-Romeo, BMW, Chrysler-Jeep, Citroen, Chevrolet-Daewoo, Daihatsu, Fiat, Ford, Honda , Hyundai, Jaguar, KIA, Land Rover, Mazda, MG-Rover, MB, Mitsubishi, Nissan, Opel, Peugeot, Porsche, Renault, Saab, Seat, Skoda, Smart, Suzuki, Toyota, Volvo, VW...
Trucks: MAN, MB, Scania...
Patent：Europe, U.S.A, Taiwan.

TC59825A-0910

Wiper Arm Puller
2-arm
With Special-Krallex-Legs
With integrated Leg-Clamp
Its special shape, the two different hook couples (with extra thin straight tips and rounded tips) and the adjusting nut make this puller almost universal in its range of application.
Application on Audi, BMW, Chevrol/Daewoo, Chrysler-Jeep, Citroen, Fiat, Ford, Honda, Hyundai, KIA, Land Rover, Mazda, MG-Rover, Nissan, Peugeot, Porsche, VW, MAN, MB, Scania.
Patent：Europe, U.S.A, Taiwan.



Ø mm min. - max.	↓ mm	max. torque Nm	max. capacity		spindle mm thread x -length	SW	Leg mm			
			t	KN			a	b	c	d
0 - 60	50	40	2,5	25	M12 x 90	13	2,5	5	8	26,5



Ø mm min. - max.	↓ mm	max. torque Nm	max. capacity		spindle mm thread x -length	SW	Leg mm			
			t	KN			a	b	c	d
0 - 60	50	25	1,5	15	M12 x 90	13	2,5	3	6	15

BMW

TC59928-3

Drive: SW 22 mm

Oil Filter Wrench

Applicable on VW-Audi, BMW, Citroën, Fiat, Ford, Lancia, Mazda, Mercedes, Nissan, Opel /Vauxhall, Peugeot, Porsche, Renault, Suzuki, Toyota, etc.
Especially suitable for Audi A3 TDI, VW Golf IV TDI, BMW E36 with 4-cylinder engines, Porsche Cayenne, Boxster, 911 and Mercedes CDI engines, as well as C- and E-Class with 4- and 6-cylinder petrol engines.
For Oil Filter with 74mm and 14 Flats.

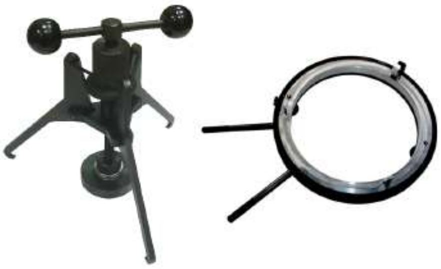
TC59928-12

Oil Filter Wrench 74mm x 14 flutes
Wrench for gasoil to immersion.
Aluminium Filter wrench in 3/8"D for use on Audi BMW,Citroen,Fiat,Ford,Lancia,Mazda, Mercedes,Nissan,Peugeot,Renault,Suzuki, Toyota,Vauxhall/Opel and Volkswagen.
14 sides Ø 74mm

TC59946

CV Boot Clamp Pliers
* For axle collar clamps on passenger cars, e.g. on VW-AUDI, OPEL, BMW, MERCEDES-BENZ, HONDA, NISSAN, MAZDA
* With lug holding-down device.
* Special Steel.
* Surface nickel-plated.

TC59957,967



BMW Self Adjusting Clutch Fixture & Centering Tool
Use to install and set all self adjusting clutches (SAC).
Use to reset and center the centering ring on self adjusting clutch .
•Applicable: BMW E34, E36, E38, E39, E46, E52, E53, E85, Z3.

BMW

TC59973

Stretch Belt Tool Kit

- Kit for mounting and dismounting the stretch belts without damaging pulleys and belts.
- Fast, easy and correct belt replacement.
- Large field of work through different mounting and dismounting tools.

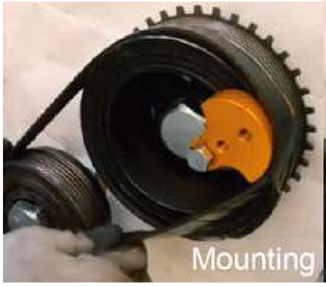
For: BMW, Cadillac, Chevrolet, Chrysler, Citroen, Fiat, Ford, GMC, Isuzu, Iveco, Lancia, Lincoln, Mazda, Mercedes, Peugeot, Volvo, etc.

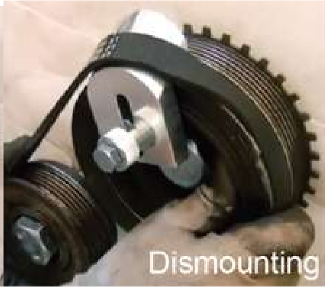
Mounting

1	Belt Installer	(⌀ 32 mm)
2	Belt Installer	(⌀ 45 mm)
3	Belt Installer	(⌀ 50 mm)
5.1	Screw	(M8x25, ⌀5.9mm)
5.2	Screw	(M8x40, ⌀5.7mm)
5.3	Screw	(M8x53, ⌀5.7mm)
5.5	Screw	(M8x65, ⌀5.6mm - L = 32.5)

Dismounting:

4.1	Belt Remover	
4.2	Self Locking Nut	
4.3	Fixing Nut	(M8)
5.4	Screw	(M8x65, ⌀5.6mm - L = 11.5)
5.5	Screw	(M8x65, ⌀5.6mm - L = 32.5)





TC59987

BMW Output Shaft Prybar - AWD
Use to remove the output shaft from the front transaxle assembly on 4WD vehicles.
•Applicable: BMW 525ix, X3, X5.

TC59997A

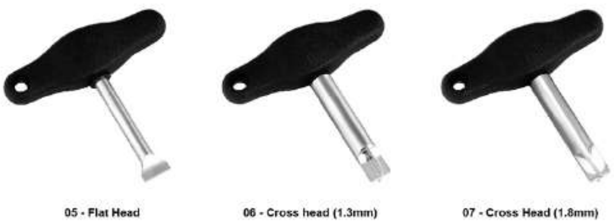
BMW Camber Adjuster
Use this fixture to adjust the front camber on late model 3 series.
•Applicable: BMW E38, E39, E46, E53, E65, E66, E67, E85, E87.

TC59997B

BMW Camber Adjusting Tool
Use to adjust front camber.
•Applicable: BMW E60, E61, E63, E64.

BMW

TC59140405,06,07

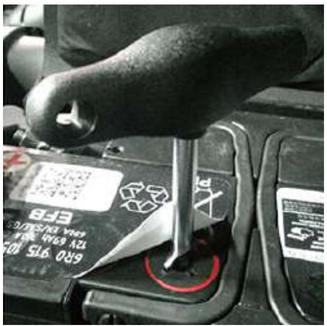


Screwdriver for Battery Screw Plug

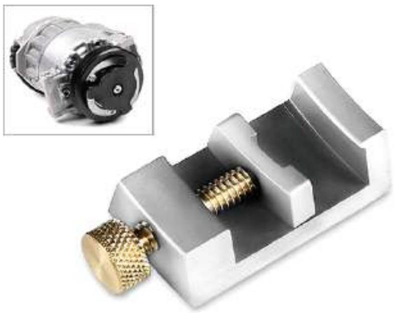
- This tool is especially designed for loosening and tightening the plastic screw plug on the starter battery.
- Also suitable for the ventilating (locking) screw on the plastic radiator without the risk of damage, for example on BMW vehicles.
- Special length allows universal universal application in areas with restricted access.

TC59140405: Flat Head

TC59140406: Cross head (1.3mm)
TC59140407: Cross head (1.8mm)

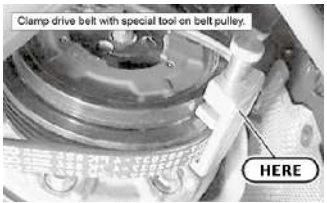


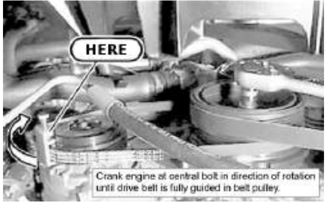
TC59140803



BMW/Mini Belt Installation Tool (N62/W17)

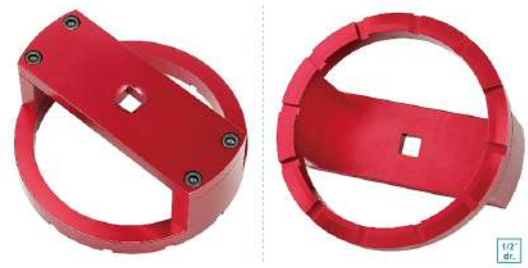
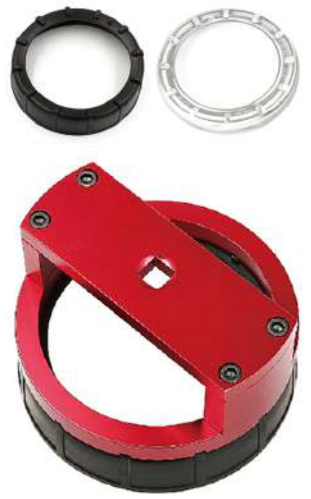
- Used for installing the drive belt that is a stretch belt and no belt tensioner is used.
- Applicable:
BMW N62 (V8) engine with the stretch belt.
Mini W17 (diesel) engine with the stretch belt.
- Comparable: BMW #641040 & #83800494518.

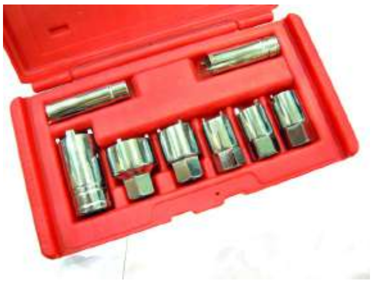

Clamp drive belt with special tool on belt pulley.



Crank engine at central bolt in direction of rotation until drive belt is fully guided in belt pulley.

BMW

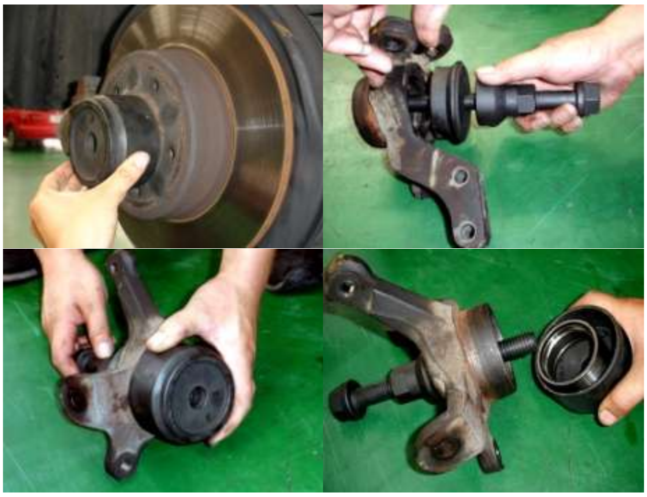
TC59141135B	2012)
	
Fuel Tank Locking Ring Tool (BMW/Mini/Porsche) - This tool is designed to remove and install the fuel tank locking ring. - OEM Ref. BMW #161020 - For BMW - E31/E34/E36/E38/E39/E46/E53/E60/E63/E64/E65/E83/E85/E90. (1988~2013) Mini - R50/R52/R53/R55/R56/R57. (1988~2013) Porsche - Boxster/Cayman (986). 911 Carrera / Turbo / GT2 / GT3 (997). (2005~	

TD59300A	
8 PCs Special Socket Set Service: Mercedes, BMW, VW, GM, Audi, Ford, Honda, Mazda, Nissan, Mitsubishi, Toyota vehicles.	

BMW

TD59745

Mercedes Benz Rear Wheel Bearing Remover & Installer
This precision machined tool is used for removing and replacing the rear wheel bearing found on Mercedes Benz rear axles. This tool is also used for the installation of the rear axle flange.
Suits Mercedes Benz models:
W124, W201, W202, W208, W210.
Bmw models:E30, E36, E46.



TD59805

Open-End Hexagon Socket
for Lambda Probes with 1/2" Female Square Drive
Universal application of the lambda probe e.g. on Ford, BMW, OPEL, VW-AUDI.

TE5920

Mercedes & BMW Ignition Lock Set
Complete kit for removal and installation for Mercedes and BMW motor vehicles. Stored in a plastic case.
Includes:
* 2 x Instrument cluster removal hooks for models: 107, 116, 123, 124, 126, 140 & 201.
* 2 x Radio removal tools for 1992 and newer Mercedes vehicles Models: 140, 129, 202 & 210.
* 2 x Ignition lock removal tools for models W124 & 201 .
* 2 x Ignition lock removal tools for models W124, 126 & 201.
TE59A.B.C Tool Set

BMW

TE5920AB

Mercedes & BMW Ignition Lock Set

Complete kit for removal and installation for Mercedes and BMW motor vehicles.

Includes:

* 2 x Instrument cluster removal hooks for models:
107, 116, 123, 124, 126, 140 & 201.

* 2 x Ignition lock removal tools for models W124 & 201.

* 2 x Ignition lock removal tools for models W124, 126 & 201.

TF5916B22

Hose Clamp Removal Tool

* Universally designed for the loosening / opening of HENN clamps as found on coolant hoses / charge air hoses in passenger cars.

* Suitable for VW-Audi, Seat, Skoda, BMW, Peugeot, Citroen, Dacia, Fiat, Ford, Kia, Lexus, Mazda, Mercedes, Nissan, Opel/Vauxhall, Porsche, Renault, Toyota, Volvo etc.

TF59663Z

3/8"-24
3/8"-27
3/8"-32
3/8"-36
3/8"-38

Oil Filter Offset Wrench Set (5 pcs)

Features:

* 24mm / 27mm / 32mm / 36mm / 38mm with 3/8" square driver.

* Low profile design with offset drive.

* Special design for tight confined areas.

* For oil filters where access is limited.

24mm:

* BMW N62 5/7 Series

27mm:

* Mercedes-Benz A Class

* Ford Fiesta 1.4/1.6 TDCi

* Renault 1.5/1.9/2.2/2.5dci

* BMW Mini

* Ford Transit 2.2/2.4/3.2

32mm:

* Vauxhall/Opel Astra-G / Corsa-B

* Volkswagen Polo 1.2 / Transporter T5 1.9

* Audi A6 3.2 TSi V6

* Ford Transit 2.0/2.4

* Chevrolet HHR / Cobalt / Cobalt SS / Malibu / Cavalier / S10 / Malibu, Maxx

* Saturn L-series / Ion / Vue

* Pontiac G6 / Solstice / Sunfire / Grand AM

* Oldsmobile Alero

* GMC Sonoma

* SAAB 9-3

36mm:

* Mercedes-Benz
220d / E220d / M604 / C250d / E250d / M605 / E300d / M606 MB / MB Transporter M616 116MB / 100 Transporter

* BMW M52 3 Series / 5 Series M60 6cyl / 5/7/8 Series M73 12 cyl 7/8 Series

* Vauxhall/Opel Vectra-B di 16v

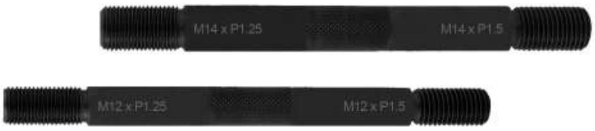
* Volkswagen Transporter T5 / Lupo 1.2 TDi / Touareg TDi

38m:

* Vauxhall/Opel Astra | Zafira 2.0/2.2 dti

BMW

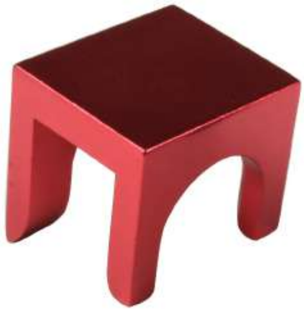
TF5917808Z



Wheel Stud Pilot Pin Set
* To easily remove and install the wheel on many vehicles.
* The wheel stud pilot pin allows you to hang the wheel without having to balance the wheel on the small lip of the hub .

Application:
M12 x P1.25: Alfa Romeo, Chrysler, Dodge and Fiat.
M12 x P1.5: Audi, Alfa Romeo, BMW, Mercedes, Mini, Porsche, Vauxhall, Volvo and VW.
M14 x P1.25: BMW and Mini.
M14 x P1.5: Audi, BMW, Citroen, Chrysler, Ferrari, Fiat, Ford, GM, Hyundai, Land Rover, Lamborghini, Opel, Mercedes, Peugeot, Porsche, Renault, Rover, Saab, Seat, Skoda, Vauxhall, Volvo, and VW.

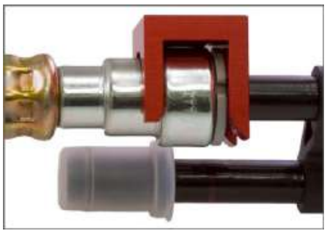
TF5940100



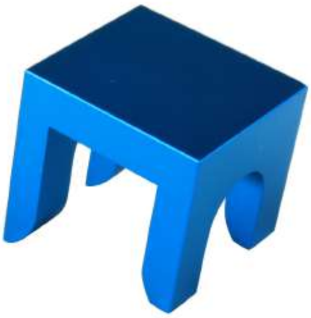
BMW Line Disconnect Tool

Power Steering and Transmission Line Disconnect Tool for 1999-2005 BMW 3-Series and X5
Made of Red-Anodized Aluminum

The New Design of the BMW 5346 Also Covers the Transmission Cooler Line



TF5940100A

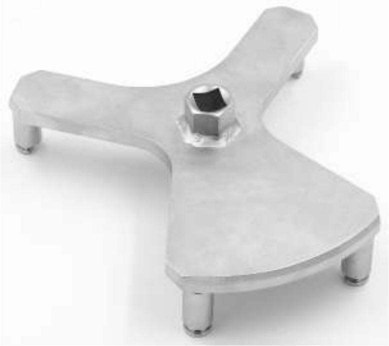


BMW Line Disconnect Tool

Power Steering and Transmission Line Disconnect Tool for 2006-2011 BMW 3-Series and 2006-2009 X3(E90 & E83).
Made of Red-Anodized Aluminum

The New Design of the BMW 5346 Also Covers the Transmission Cooler Line

TF59150127

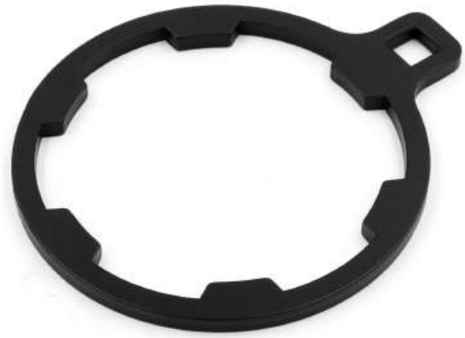


SCR / Fuel Tank Locking Ring Tool (VAG group / BMW)
VAG group
* This tool is designed to remove and install the SCR Tank locking ring.
* For 6-cylinder 3.0L 4V TDI common rail engine Audi A6 2011>, A7 Sportback 2011>, A8 2010>
* OEM Ref. T40268

BMW
* This tool is designed to remove and install the Fuel Tank locking ring.
* For BMW F01 / F02 / F25
* OEM Ref.: 161190

BMW

TF59151009	2 in 1 Design Brake pad Tire tread
Tire Tread Depth & Brake Pad Thickness Gauge Used for measuring thickness of brake pad and depth of tire tread. OEM Ref: T40139A (VW) / 341260 (BMW) / 211589062300 (Benz)	

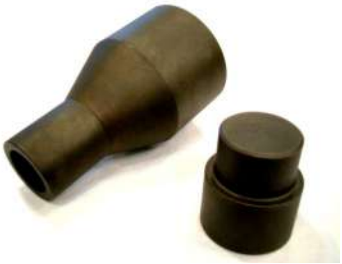
TF59160909	**Radiator / Coolant Cap Wrench (BMW)** * Can be used to loosen stubborn caps on radiators and reservoirs. * Especially suitable for use in tight spaces. * Works on BMW vehicles: E60, E61, E63, E64, E70, E71, E72, E81, E82, E84, E87, E88, E89, E90, E91, E92, E93. F01, F02, F03, F04, F06, F07. F10, F11, F12, F13 , F15, F16, F18, F20, F21, F25, F26, F30, F31, F32, F33, F34, F35, F36, F80, F82, F83, F85, F86 .
	

MERCEDES

TB592030C

Mercedes Benz Ball Joint Remover/Installer
* For removing and installing the ball joint into the steering knuckle.
* Applicable: W220

TB592030D



Benz Ball Joint Remover/Installer

TB592030G

BENZ (W220/W211/W230) Ball-Joint Installer/ Remover(Tools, Repair Tools, Auto Tools)
*On car maintenance.
*Special design to remove & install the ball joint without removing any parts.
*Applicable:Benz W220/W211/W230

TB592030H

Mercedes Benz Ball Joint Tool Kit

8 pcs tool kit for servicing (installation and removal) of the specified ball joints in the Mercedes suspensions without removing arms or spindle.

A. Front suspension ball joint press fixtures for W211/W215/W219/W220/W(R)230 chassis.
B. Front sway bar ball joint (pressed into control arm) press fixtures for W211/W219/W220.

Application: Mercedes Benz W163/W164/W211/W215/W219/W220/W(R)230

W211	2003-2009	E class
W215	2002-2006	CL class
W219	2006 and newer	CLS class
W220	2000-2006	S class
W(R)230	2003-2008	SL class

MERCEDES

TB592030I

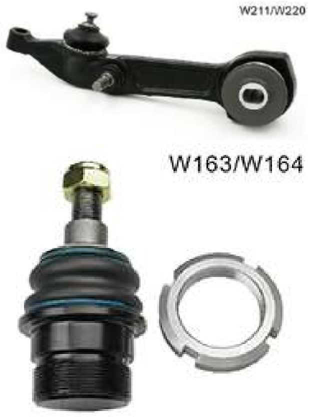
Mercedes Benz Ball Joint Tool Master Kit

10 pcs tool kit for servicing (installation and removal) of the specified ball joints in the Mercedes suspensions without removing arms or spindle.

A. Front suspension ball joint press fixtures for W211/W215/W219/W220/W(R)230 chassis.
B. Front sway bar ball joint (pressed into control arm) press fixtures for W211/W219/W220.
C. Front & rear suspension ball joint press fixtures for W163/W164 chassis.
D. Ball joint socket for servicing front & rear ball joint on W163/W164 chassis.

Application: Mercedes Benz W163/W164/W211/W215/W219/W220/W(R)230

W163	1998-2005	M class
W164	2006 and newer	M class
W211	2003-2009	E class
W215	2002-2006	CL class
W219	2006 and newer	CLS class
W220	2000-2006	S class
W(R)230	2003-2008	SL class



TB593500-10

RADIO
REMOVAL
TOOL KIT
Ford VW Audi
BMW
New Beetle Audi
Mercedes -Benz
VW
BMW

10Pc. Radio Removal Tool Set

Set includes the following tools needed to install and remove radios:
* 2pc. Din Radio Removal U-Hooks (Ford/VW/Audi)
* 1pc. Special Pentagon Wrench (BMW)
* 2pc. Radio Removal Keys (New VW Beetle/Audi)
* 2pc. Radio Removal Keys (Mercedes Benz)
* 2pc. Radio Removal Keys (VW)
* 1pc. Allen Hex Wrench (BMW)

TB593500-18

18Pc. Radio Removal Tool Set

Set includes the following tools needed to install and remove radios:
* 4pc. Radio Removal Keys (New VW Beetle/Audi)
* 2pc. Radio Removal Keys (Mercedes Benz)
* 2pc. Radio Removal Keys (VW)
* 2pc. Radio Removal Keys (New Skoda)
* 2pc. Radio Removal Keys (New Becker)
* 2pc. Din Radio Removal U-Hooks (New Blaupunkt)
* 1pc. Allen Hex Wrench (BMW)
* 2pc. Din Radio Removal U-Hooks (Ford/VW/Audi)
* 1pc. Special Pentagon Wrench (BMW)

MERCEDES

TB593500-18A	**18Pc. Radio Removal Tool Set** Set includes the following tools needed to install and remove radios: * 4pc. Radio Removal Keys (New VW Beetle/Audi) * 2pc. Radio Removal Keys (Mercedes Benz) * 2pc. Radio Removal Keys (VW) * 2pc. Radio Removal Keys (New Skoda) * 2pc. Radio Removal Keys (New Becker) * 2pc. Din Radio Removal U-Hooks (New Blaupunkt) * 1pc. Allen Hex Wrench (BMW) * 2pc. Din Radio Removal U-Hooks (Ford/VW/Audi) * 1pc. Special Pentagon Wrench (BMW)

TB593500-20	**20Pc. Radio Removal Tool Set** Set includes the following tools needed to install and remove radios: * 4pc. Radio Removal Keys (New VW Beetle/Audi) * 2pc. Radio Removal Keys (Mercedes Benz) * 2pc. Radio Removal Keys (VW) * 2pc. Radio Removal Keys (New Skoda) * 2pc. Radio Removal Keys (New Becker) * 2pc. Radio Removal Keys (Pioneer) * 2pc. Din Radio Removal U-Hooks (New Blaupunkt) * 1pc. Allen Hex Wrench (BMW) * 2pc. Din Radio Removal U-Hooks (Ford/VW/Audi) * 1pc. Special Pentagon Wrench (BMW)

TB593500-46	**46Pc. Radio Removal Tool Set** * 1 - 2 x KENWOOD II 1998-2001 * 2 - 2 x SONY II ab 2002 * 3 - 2 x KENWOOD III ab 2002 * 4 - 2 x PIONEER & JVC * 5 - 2 x SONY I bis 2001 * 6 - 2 x PANASONIC * 6A- 2 x PANASONIC 2006 * 7 - 2 x MERCEDES BENZ & BMW * 8 - 2 x MERCEDES BENZ & BMW * 9 - 2 x MERCEDES BENZ & BMW * 10 - 2 x CLARION-NEU * 11 - 2 x CLARION (ALT) * 12 - 2 x FIAT BRAVA * 13 - 2 x OPEL * 14 - 2 x BLAUPUNKT, GRUNDIG, VW, AUDI, FORD * 15 - 1 x BMW * 16 - 4 x VW, AUDI, BECKER, MERCEDES BENZ * 17 - 2 x BECKER, PORSCHE, MERCEDES BENZ * 18 - 2 x VW * 19 - 1 x BMW, OPEL-Inbus * 20 - 2 x BECKER NEU ab 2002 * 21 - 2 x SKODA NEU ab 2002 * 22 - 2 x BLAUPUNKT NEU ab 2002

TB593500-46A	**46Pc. Radio Removal Tool Set** * 1 - 2 x KENWOOD II 1998-2001 * 2 - 2 x SONY II ab 2002 * 3 - 2 x KENWOOD III ab 2002 * 4 - 2 x PIONEER & JVC * 5 - 2 x SONY I bis 2001 * 6 - 2 x PANASONIC * 6A- 2 x PANASONIC 2006 * 7 - 2 x MERCEDES BENZ & BMW * 8 - 2 x MERCEDES BENZ & BMW * 9 - 2 x MERCEDES BENZ & BMW * 10 - 2 x CLARION-NEU * 11 - 2 x CLARION (ALT) * 12 - 2 x FIAT BRAVA * 13 - 2 x OPEL * 14 - 2 x BLAUPUNKT, GRUNDIG, VW, AUDI, FORD * 15 - 1 x BMW * 16 - 4 x VW, AUDI, BECKER, MERCEDES BENZ * 17 - 2 x BECKER, PORSCHE, MERCEDES BENZ * 18 - 2 x VW * 19 - 1 x BMW, OPEL-Inbus * 20 - 2 x BECKER NEU ab 2002 * 21 - 2 x SKODA NEU ab 2002 * 22 - 2 x BLAUPUNKT NEU ab 2002

ToolMaster

MERCEDES

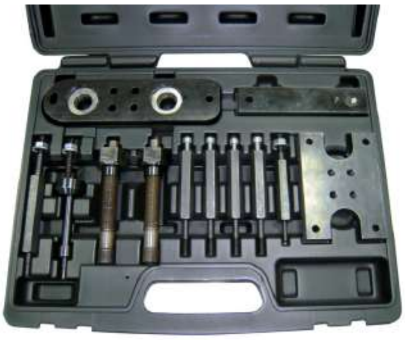
TB597700	**Front Coil Spring Compressor Kit** Suits: Mercedes Benz Models: W116, W123, W124, W126, W129, W140, W170, W201, W202, W210, GM, Opel, Peugeot, Rover, Saab, Volvo, VW T2, Ford Taurus, Hyundai, Mitsubishi Lada, Skoda, etc. Features extra strong Trapezoid thread on center screw. Supplied in blow mold storage case. Maximum Capacity: 5-1/2"(140mm) Spring diameter Overall Length: 13-3/8"(340mm)

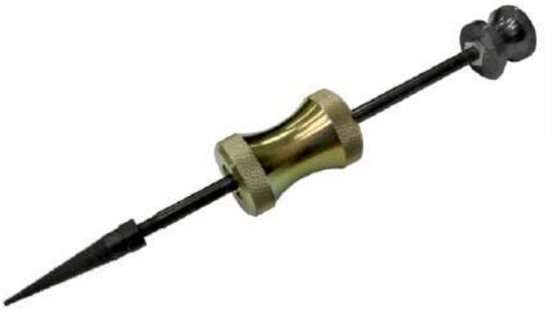
TB597800A	**Crankshaft Pulley Holder(Equilateral Triangle)** Break loose the crank shaft pulley / harmonic balancer bolt. Designed to properly secure the pulley from rolating during R & R of crank bolt. Counter Holder Tool / Harmonic Balancer holder for the front crankshaft pulley Mercedes M112 and M113. This tool was redesigned to fit both versions of the Mercedes-Benz pulley. 112,113,E320,ML320,CLK320,E430,ML430,C320,C43,E55 etc... C-class from 1998-2005 with V-6 or V-8 engine. E-class from 1998-2005 with V-6 or V-8 engine. SLK-class from 1998-2005 with V-6 engine. CLK-class from 1998-2005 with V-6 or V-8 engine. ML-class from 1998-2005 with V-6 or V-8 engine. SL-class from 1999-2006 with V-8 engine. S-class from 2000-2005 with V-8 engine. G-class from 2002-2007 with V-8 engine.

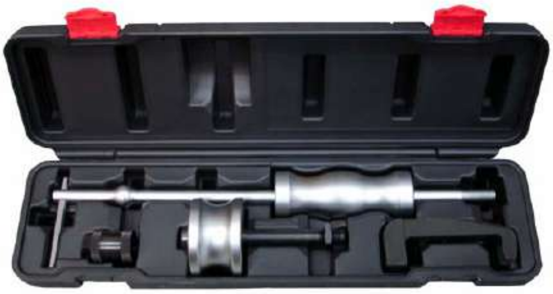
TB598200B	**Antenna Wrench & Radio Service Set** Set includes: * Universal Antenna Wrench * GM Code Retriever * Chrysler Radio Removal Socket * Ford Radio Removal Lock Pin Set * 1/4" Hex Bit Holder Socket * 1/4" Hex Torx Bits: T10 & T15 * 1/4" Hex Tamper Torx Bits: T7, T10, & T15 * BMW models with anti-theft radio. * Audi A4, A6, A8 and VW New Beetle. * For 1992 & newer Mercedes 129, 140, 163, 202, and 210 models. * For VW New Body Style Passat, Jetta and Golf.

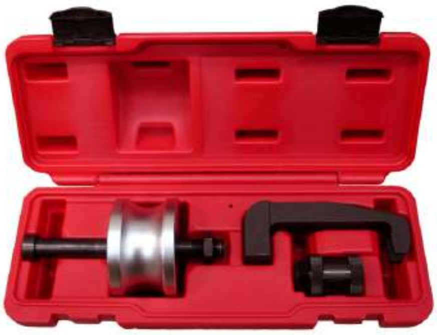
TC59007	**Double-Ring Shaped Counterholder** For counterholding when operating the bottom strut unit screws on MERCEDES-BENZ type 169 (A-class) • Especially adapted to the limited space • Very helpful for installation or removal works, measurements /adjusting work. Additional counterholding with a second hand (with a second mechanic) and another tool is not necessary • 2 x 21 mm 12-point profile • Dimensions (L x W): 90 x 30 mm • Thickness: 8 mm

MERCEDES

TC59019A	**Injector Nozzle Puller** Mercedes CDI Suitable for Mercedes CDI engine OM 668 e.g . A-Class The injector nozzle pujller makes it possible to remove even nozzles that are a very tight fit in the cylinder head, without the cylinder head having to be removed from the engine.
	

TC59029	**Puller for Sealing Ring** For use on sealing rings with internal diameter 4 - 16 mm, e.g. injector nozzle sealing rings on Mercedes CDI engines. The puller extracts the sealing rings correctly, for example from between the injector nozzle and the cylinder head. To pull out the sealing ring, screw the taper point of the tool into it, then remove with the impact-type puller. length: 36.5*5.5*5cm
	

TC59047	**Injector Extractor** For removing seized or stuck Common Rail injectors without having to disassemble the cylinder head. Applicable for MERCEDES-BENZ CDI engines 611, 612, 613, etc. • Especially suited to the limited spaces due to the cylinder head cover. Contents: 1 Impact Extractor 1 Injector Claw 1 External Adapter-With internal threads. In conjunction with Impact Extractor. 1 Slide Hammer
	

TC59047A	**Injector Nozzle Puller With Slide Hammer** Injector nozzles that do not fit very tightly can be pulled out without needing to take them apart or remove the cylinder block.The puller is additionally supported by the steel ball on the valve cover , which prevents the puller from tipping during the removal process. Applicable for Mercedes-Benz CDI engines OM 611/612/613
	

MERCEDES

TC59047A-A

Injector Nozzle Puller With Slide Hammer
Injector nozzles that do not fit very tightly can be pulled out without needing to take them apart or remove the cylinder block.The puller is additionally supported by the steel ball on the valve cover , which prevents the puller from tipping during the removal process. Applicable for Mercedes-Benz CDI engines OM 611/612/613

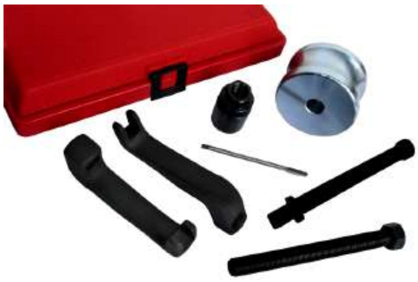
TC59047B-M13

Injector Extractor
For removing seized or stuck Common Rail injectors without having to disassemble the cylinder head. Applicable for MERCEDES-BENZ CDI engines 611, 612, 613, etc.

- Especially suited to the limited spaces due to the cylinder head cover

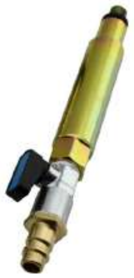
Contents:
1 Impact Extractor
1 Injector Claw
1 External Adapter-With internal threads. In conjunction with Impact Extractor.

TC59047C



Injector Puller Set
Mercedes CDi
This six piece puller set has been especially designed for removing stubbon injectors on Mercedes Benz vehicles fitted with CDi engines. Packed in a blow moulded case.

TC59047D -06



Part for Injector Nozzle Tool
Set Mercedes CDI Engine

TC59047D -07

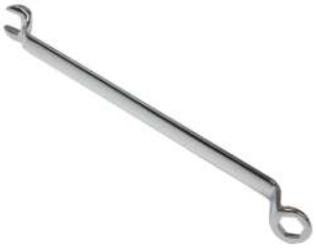
Thread tap with drill-bit tip
Applicable e.g. for Mercedes CDI engines OM 611, 612, 613, etc.
For recutting and cleaning the tapped hole to retain the injector nozzle
holder. Important:

MERCEDES

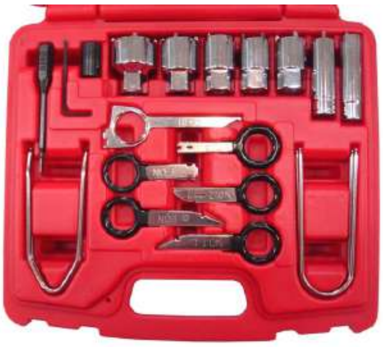
TC59047D-0202	**Milling tool for mounting** hole and injector nozzle seat Applicable for Mercedes CDI engines OM611, 612, 613 and Smart R660. In a single machining operation, the specially shaped milling cutter produces a clean finish on the injector mounting hole, the nozzle seat and the small aperture leading to the combustion chamber. Important before assembly to prevent the risk of leaks between the cylinder head and the injector.

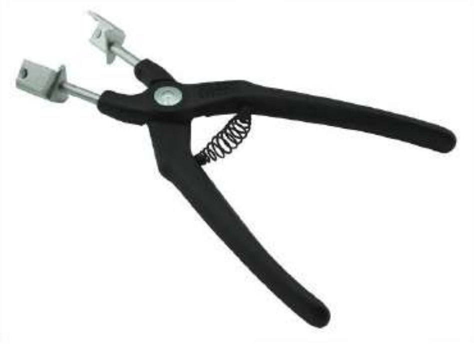
TC59057	**Shock Absorber Screwing Pin Wrench** For the operation of the upper shock absorberscrewing on MERCEDES-BENZ, type 211 T-model rear (E-class station wagon) • The recess in the front part of the pin wrench provides access to the piston rod and allows the direct application of an operating tool • Plastic coated blade prevents damage • Operation with 3 front pins, Ø 8 mm • Length: 230 mm

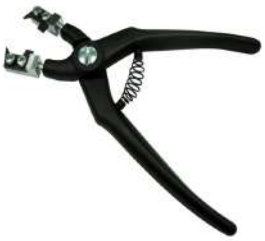
TC59057A	**Shock Absorber Toothed Socket** •Suitable for Mercedes W211 T-Model rear axle. •Necessary to loosen and tighten the connecting rod clamp nut. •During loosening the rod clamp nut the upper lock washer is counterheld by means of the toothed socket TC59229. •Drive:3/8"

TC59080-17	
Spark Plug Boot Puller Wrench Application: Benz V6	Engine. TC59080-17 17mm

MERCEDES

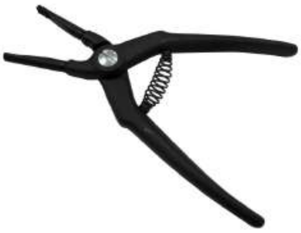
TC59146A	**26PC. Universal Radio Removal Kit & Antenna Wrench Kit** * 4pc. Radio Removal Keys (New VW Beetle/Audi) * 2pc. Radio Removal Keys (Mercedes Benz) * 2pc. Radio Removal Keys (VW) * 2pc. Radio Removal Keys (New Skoda) * 2pc. Radio Removal Keys (New Becker) * 2pc. Din Radio Removal U-Hooks (New Blaupunkt) * 1pc. Allen Hex Wrench (BMW) * 2pc. Din Radio Removal U-Hooks (Ford/VW/Audi) * 1pc. Special Pentagon Wrench (BMW) * 7pc. Special Socket Set * 1pc. Chrysler Radio Removal Socket
	

TC59199A	**Relay Pliers** • For safe installing and removing of relays, even small ones, e.g. on OPEL, FORD, MAZDA, CHRYSLER, NISSAN, VW passenger cars, MERCEDES-BENZ, MAN, IVECO commercial vehicles • Jaws made of special steel • Pliers with solid plastic body • DBGM - German registered utility model Material: Steel
	

TC59199D	
Hose Clamp Pliers . For progressively adjustable clamps without lug holding-down device, e.g. for axle boots on VW-AUDI, MERCEDES-BENZ and TOYOTA	

MERCEDES

TC59199E

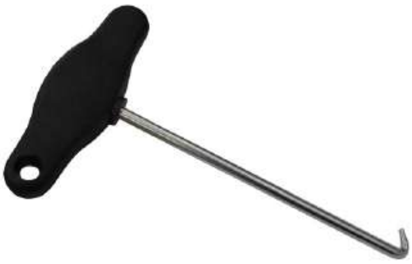


Incandescent Gripper

- Special pliers for installation and removal of light bulbs with glass base e.g. Light bulb in the blower switch to VW Passat since 1996, SEAT León Bulb in the air recirculation switch to OPEL Astra F, MERCEDES-BENZ passenger cars and RENAULT
- Tip: special steel with plastic sleeves
- Pliers: All-plastic body

Material: 6150&POM;

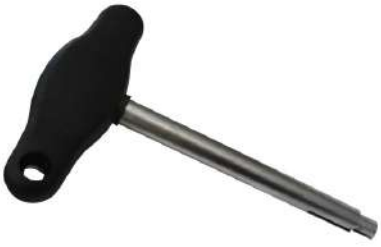
TC59207-09



Assembly Tool

- For installing and removing the draw spring of hand brake shoes, e.g. on MERCEDES-BENZ passenger cars with rear disc brakes as well as on VW LT since 1997
- Hook with T-Handle
- Special steel
- Surface chrome-plated

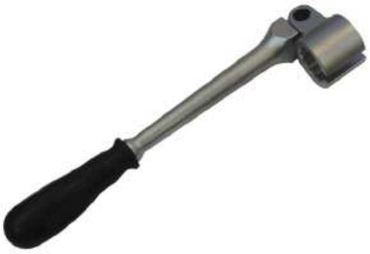
TC59207-10



Brake Spring Installer

- For pressure spring of packing brake.
- Applicable: all Mercedes models.

TC59258A



Straight Socket 22mm hex

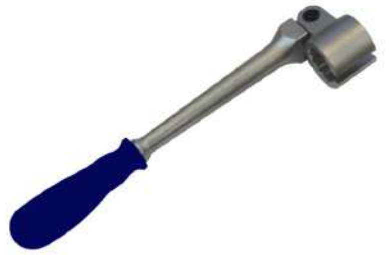
Application: VW-Audi, BMW, Mercedes, Ford, Opel/Vauxhall, Peugeot, Citroën, Renault, Seat, Skoda, Japanese cars, etc.

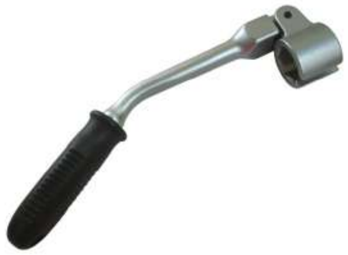
6*12-point: 22mm

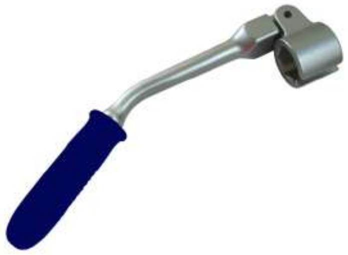
Length: 250mm

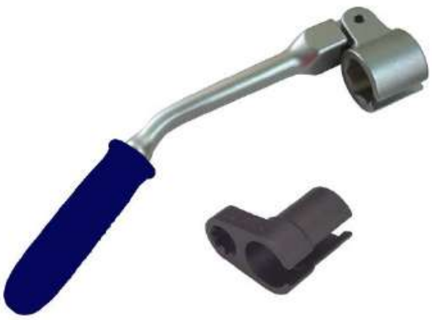
Weight: 450g

MERCEDES

TC59258A-1	
Straight Socket 22mm hex Application: VW-Audi, BMW, Mercedes, Ford, Opel/Vauxhall, Peugeot, Citroën, Renault, Seat, Skoda, Japanese cars, etc. 12*12-point: 22mm Length: 250mm Weight: 450g	

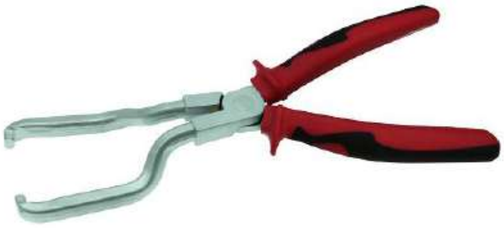
TC59258B	
Angled Socket 22mm hex Application: VW-Audi, BMW, Mercedes, Ford, Opel/Vauxhall, Peugeot, Citroën, Renault, Seat, Skoda, Japanese cars, etc. Angle bent at 30o 6*12-point: 22mm Length: 250mm Weight: 450g	

TC59258B-1	
Angled Socket 22mm hex Application: VW-Audi, BMW, Mercedes, Ford, Opel/Vauxhall, Peugeot, Citroën, Renault, Seat, Skoda, Japanese cars, etc. Angle bent at 30o 12*12-point: 22mm Length: 250mm Weight: 450g	

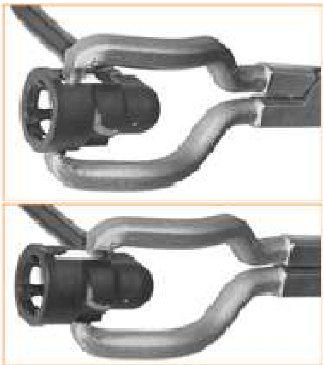
TC59258B-1_970	**Angled Socket 22mm hex** Application: VW-Audi, BMW, Mercedes, Ford, Opel/Vauxhall, Peugeot, Citroën, Renault, Seat, Skoda, Japanese cars, etc. Angle bent at 30o 12*12-point: 22mm Length: 250mm Oxygen Sensor Wrench Needed for servicing today's computer-controlled vehicle systems. Easily removes the oxygen sensor located in the exhaust manifold. Heat treated cast steel. Has 7/8" hex, 1/2" square drive (double square for easy access).
	

MERCEDES

TC59309



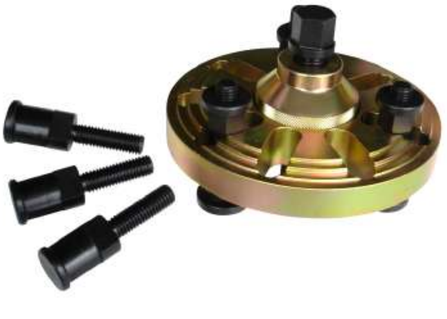
Fuel Line Pliers
Suitable for VW-Audi, Fiat, GM, Opel, Mercedes etc.
e.g. Mercedes M-Class with Petrol engines.
For removal and replacement of the connections on the in-line Fuel Filter.
Required when replacing the Fuel Filter or during engine repairs.
Removal of Connector:
Pull the connector backwards with the Pliers .
Replacing the Connector:
Slide the connector forwards with the Pliers.
Length: 240 mm



TC59316

Oil and Diesel Oil Filter Wrench
14 sides
Ø: 74mm
H: 68mm
Application: Toyota/Lexus, VW-Audi, Ford, BMW, Opel, Mercedes-Benz, Peugeot, Citroen, Renault, Mazda, etc...

TC59317A

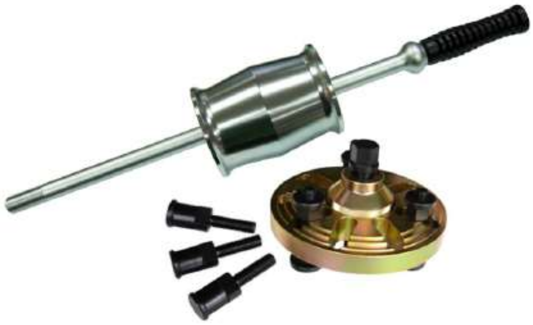


Pulley-Extractor and Reaction Tool
Universal application：
VW-Audi, Seat, Škoda, Opel/Vauxhall Ford, BMW, Mercedes, Peugeot, Citroën, Renault, Fiat, Japanese vehicles, etc.
Loosen the retaining bolt and extract the Pulley.
Suitable for all Pulleys with holes with a PCD Ø from 70 mm - 100 mm.
Suitable for hole Ø from minimum 20 mm.
To lock the Pulley while loosening or tightening the retaining bolt, as well as preventing the Pulley from rotating duringextraction. Any available ½“ ratchet or extension drive may be used as the reaction tool.
Consists of:
* 1 x Puller Plate
* 3 x Hook Ø 20 mm
* 3 x Hook Ø 26 mm
* 3 x Shoulder Nut M10
* 1 x Pressure-Unit

ToolMaster

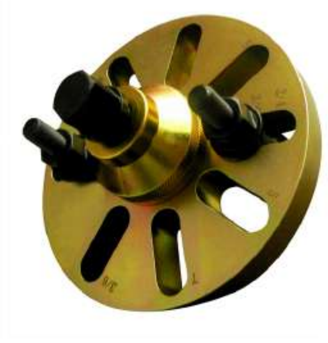
MERCEDES

TC59317A-HM



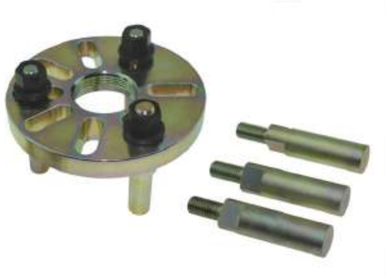
Pulley-Extractor and Reaction Tool
Universal application :
VW-Audi, Seat, Škoda, Opel/Vauxhall Ford, BMW, Mercedes, Peugeot, Citroën, Renault, Fiat, Japanese vehicles, etc.
Loosen the retaining bolt and extract the Pulley.
Suitable for all Pulleys with holes with a PCD Ø from 70 mm - 100 mm.
Suitable for hole Ø from minimum 20 mm.
To lock the Pulley while loosening or tightening the retaining bolt, as well as preventing the Pulley from rotating duringextraction. Any available ½" ratchet or extension drive may be used as the reaction tool.
Consists of:
* 1 x Puller Plate
* 3 x Hook Ø 20 mm
* 3 x Hook Ø 26 mm
* 3 x Shoulder Nut M10
* 1 x Pressure-Unit
* 1x Hammer (L=495mm)

TC59317B



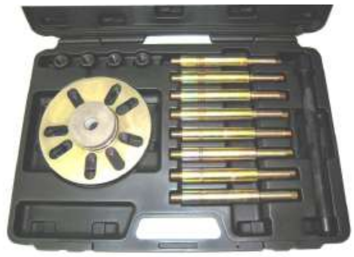
Pulley-Extractor and Reaction Tool
As TC59317A Pulley-Extractor and Reaction Tool but with 2 Hooks Ø- 26 mm and 2 Hexagonal Nuts .
Suitable for VW-Audi, Seat, Škoda, Opel/Vauxhall Ford, BMW, Mercedes, Peugeot, Citroën, Renault, Fiat, Japanese vehicles, etc.
Consists of:
* 1 x Puller Plate
* 2 x Hook Ø 26 mm
* 2 x Shoulder Nut M10
* 1 x Pressure-Unit

TC59317C



Reaction Tool
Applicable for Mercedes Motor z.B. M112, M113 and OM642, etc.
For counter-holding the crankshaft belt pulley when screwing and unscrewing the central crankshaft bolt.

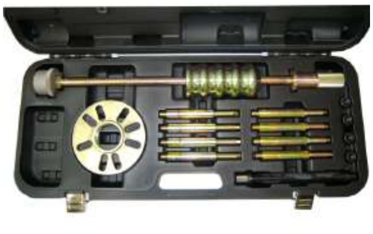
TC59317D



Puller Set

Suitable for : VW-Audi, Alfa Romeo, BMW, Citroën,
Fiat Ford, Mazda, Mercedes, Opel,
Porsche, Renault, Seat, Škoda, etc.

TC59317D
(SET)



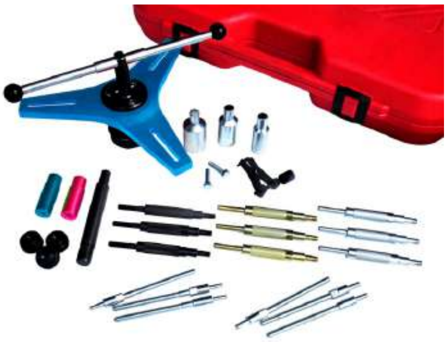
Puller Set & Slide Hammer

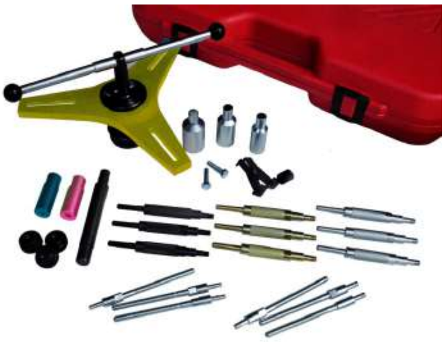
Suitable for : VW-Audi, Alfa Romeo, BMW, Citroën,
Fiat Ford, Mazda, Mercedes, Opel,
Porsche, Renault, Seat, Škoda, etc.

MERCEDES

TC59317D-HM	**Slide Hammer** Weight: 4.8 kg Suitable for : VW-Audi, Alfa Romeo, BMW, Citroën, Fiat Ford, Mazda, Mercedes, Opel, Porsche, Renault, Seat, Škoda, etc.

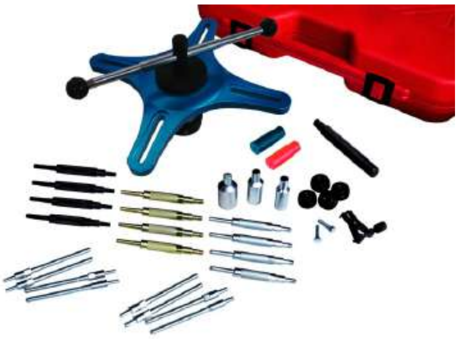
TC59388	**Self Adjusting Clutch Assemble Tool** For removal and installation of self adjusting clutches fitted to BMW/VAG/Mercedes/Volvo/ Renault/Vauxhall/Opel. The tool allows the clutch pressure plate to be pretension prior to removal and installation, avoiding distortion to the plate. The tool also allows the clutch plate to be centred accurately on the guide bearing or pressure plate and the adjusting ring rewound. ·Material：Aluminum.

TC59388-30	**Complete Kit For Assembling And Disassembly Of Self Adjusting Clutches** (3 hole pitch) Suitable for most Self Adjusting Clutches SAC(3 holes) equipped on vehicles of FIAT GROUP, VW-AUDI, BMW, MERCEDES, VOLVO, OPEL, RENAULT etc. Allows operations on clutch equipped with this device in order to prevent any damage to system and to keep adapter ring in right position. Advantages： ·Pre-tightening of disk pushing plate during assembly and disassembly avoiding clutch deformation. ·Alignment of clutch disk to drive bearing or to disk pushing plate. ·Material：Aluminum.
	

TC59388-30A	**Complete Kit For Assembling And Disassembly Of Self Adjusting Clutches** (3 hole pitch) Suitable for most Self Adjusting Clutches SAC(3 holes) equipped on vehicles of FIAT GROUP, VW-AUDI, BMW, MERCEDES, VOLVO, OPEL, RENAULT etc. Allows operations on clutch equipped with this device in order to prevent any damage to system and to keep adapter ring in right position. Advantages： ·Pre-tightening of disk pushing plate during assembly and disassembly avoiding clutch deformation. ·Alignment of clutch disk to drive bearing or to disk pushing plate. ·Material：Steel.
	

MERCEDES

TC59388-40



Complete Kit For Assembling And Disassembly Of Self Adjusting Clutches

(4 hole pitch)

Suitable for most Self Adjusting Clutches SAC(4 holes) equipped on vehicles of FIAT GROUP, VW-AUDI, BMW, MERCEDES, VOLVO, OPEL, RENAULT etc.

Allows operations on clutch equipped with this device in order to prevent any damage to system and to keep adapter ring in right position.

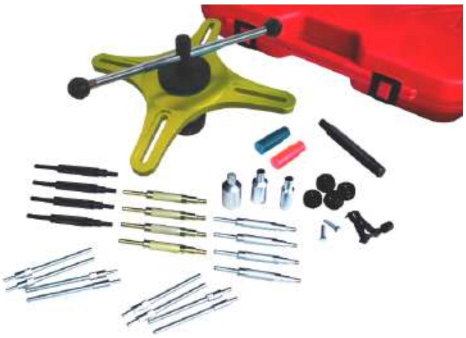
Advantages：

·Pre-tightening of disk pushing plate during assembly and disassembly avoiding clutch deformation.

·Alignment of clutch disk to drive bearing or to disk pushing plate.

·Material：Aluminum.

TC59388-40A



Complete Kit For Assembling And Disassembly Of Self Adjusting Clutches

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Suitable for most Self Adjusting Clutches SAC(4 holes) equipped on vehicles of FIAT GROUP, VW-AUDI, BMW, MERCEDES, VOLVO, OPEL, RENAULT etc.

Allows operations on clutch equipped with this device in order to prevent any damage to system and to keep adapter ring in right position.

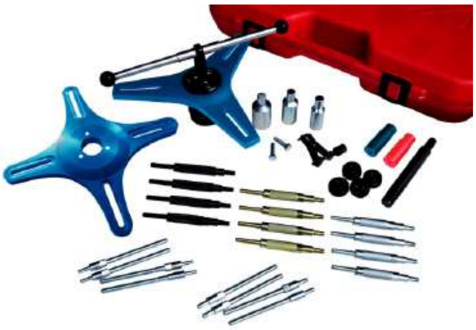
Advantages：

·Pre-tightening of disk pushing plate during assembly and disassembly avoiding clutch deformation.

·Alignment of clutch disk to drive bearing or to disk pushing plate.

·Material：Steel.

TC59388-3040



Complete Kit For Assembling And Disassembly Of Self Adjusting Clutches

(3 and 4 hole pitch)

Suitable for most Self Adjusting Clutches SAC(3 and 4 holes) equipped on vehicles of FIAT GROUP, VW-AUDI, BMW, MERCEDES, VOLVO, OPEL, RENAULT etc.

Allows operations on clutch equipped with this device in order to prevent any damage to system and to keep adapter ring in right position.

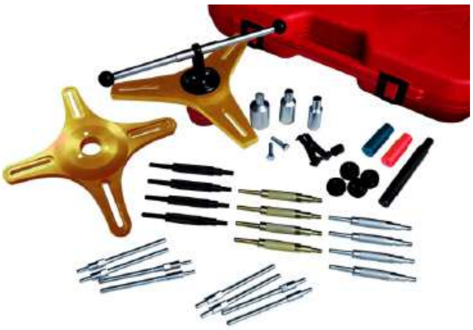
Advantages：

·Pre-tightening of disk pushing plate during assembly and disassembly avoiding clutch deformation.

·Alignment of clutch disk to drive bearing or to disk pushing plate.

·Material：Aluminum.

TC59388-3040A



Complete Kit For Assembling And Disassembly Of Self Adjusting Clutches

(3 and 4 hole pitch)

Suitable for most Self Adjusting Clutches SAC(3 and 4 holes) equipped on vehicles of FIAT GROUP, VW-AUDI, BMW, MERCEDES, VOLVO, OPEL, RENAULT etc.

Allows operations on clutch equipped with this device in order to prevent any damage to system and to keep adapter ring in right position.

Advantages：

·Pre-tightening of disk pushing plate during assembly and disassembly avoiding clutch deformation.

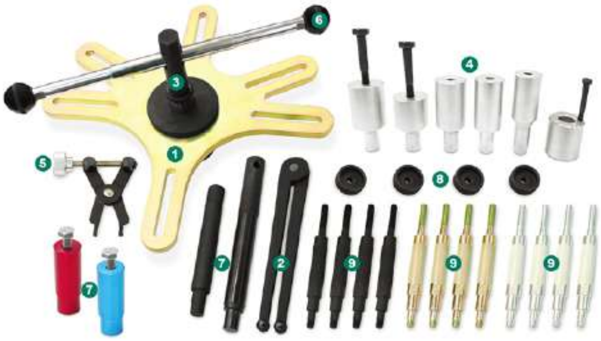
·Alignment of clutch disk to drive bearing or to disk pushing plate.

·Material：Steel.

MERCEDES

<table>
<tr><td>TC59388-ST</td><td rowspan="2">Self Adjusting Clutch Assemble Tool
For removal and installation of self adjusting clutches fitted to BMW/VAG/Mercedes/Volvo/ Renault/Vauxhall/Opel.
The tool allows the clutch pressure plate to be pretension prior to removal and installation, avoiding distortion to the plate. The tool also allows the clutch plate to be centred accurately on the guide bearing or pressure plate and the adjusting ring rewound.
·Material：Steel.</td></tr>
<tr><td> </td></tr>
</table>

<table>
<tr><td>TC59388E</td><td rowspan="2">SAC Clutch Tool Master Kit

- This kit allows the professional dismounting and mounting of all self adjusting clutches (SAC) e.g. on VW, Audi, BMW, Ford, Mercedes-Benz, Opel, Renault, Volvo, etc.
- During assembling and disassembling operations the pre-tightening of the pressure plate is required in order to avoid cluctch deformation.
- The 6-arms plate has been designed for use with 3 and 4 fixing points, for clutches with 6 or 8 locking holes.
<table>
<tr><td>1. Clamping tool for SAC clutches with 6(8) locking holes</td></tr>
<tr><td>2. Face spanner</td></tr>
<tr><td>3. Compression strut</td></tr>
<tr><td>4. Clutch mandrel set (BMW)
(a) 15mm x 23mm
(b) 15mm x 26.5mm
(c) 15mm x 28mm
(d) 15mm x 32.5mm
(e) 15mm x 34mm
(f) Centering sleeve (15mm / 32.5mm)</td></tr>
<tr><td>5. Clutch resetting tool</td></tr>
<tr><td>6. Handle for clamping tool (2pcs)</td></tr>
<tr><td>7. Clutch centering tools
(a) Blue: 19.75mm diameter
(b) Pink: 20.75mm diameter
(c) Black stepped: 19mm/15mm/14mm
(d) Black stepped: 22mm/20mm/15mm(VW)</td></tr>
<tr><td>8. Knurled nuts for threaded bolts (4 pcs)</td></tr>
<tr><td>9. 3 sets of 4 threaded bolts
(a) Silver: M6 / 1.0 screw thread
(b) Black: M8 / 1.25 screw thread
(c) Gold: M7 / 1.0 screw thread</td></tr>
</table>
</td></tr>
<tr><td>
</td></tr>
</table>

MERCEDES

TC59433B

Stretch Belt Installation Tools
Quickly and easily install stretch belt found on many late model vehicles. These drive systems do not have a tensioner and require the proper installation tools to avoid damage to belts.

Applications :
BMW, Volvo,Mercedes,Mazda

TC59437B

Oil Pan Repair Master Set
*Feature: Solid and fast solution for the repair of defective oil drain screw thread without the expensive replacement of the sump.
*Application: The damaged thread is simply to tap away to the next size expands. Oil drain screw in part with Allen drive for oil pans with recessed drain opening suitable.
*Universal applications e.g. for: Audi, BMW, Citroen, Daimler-Benz, Ford, Fiat, Honda, Mazda, Mitsubishi, Nissan, Opel, Peugeot, Porsche, Renault, Saab, Seat, Skoda, Toyota, Volvo, VW etc.
*Scope of supply: complete with 1 / 3 foam insert in the plastic case. Replacement oil drain screw and aluminum seals are available.
*Consisting of:
1─Special Taps M13x1.5
1─Special Taps M15x1.5
1─Special Taps M17x1.5
1─Special Taps M20x1.5
5─Oil drain plug gasket with aluminum M13x1.5 external drive 6-kant SW17
5─Oil drain plug gasket with aluminum M15x1.5 external drive 6-kant SW19
5─Oil drain plug gasket with aluminum M17x1.5 inner drive 6-kant SW 8
5─Oil drain plug gasket with aluminum M20x1.5 inner drive 6-kant SW 10

TC59445

8 PC. Door Hinge Remover & Installer Set
Applicable: VW, Audi, Seat, Skoda, Mercedes, Renault.
Bits size: M8, M10, M12, T30, T40, T45, T50

TC59445A

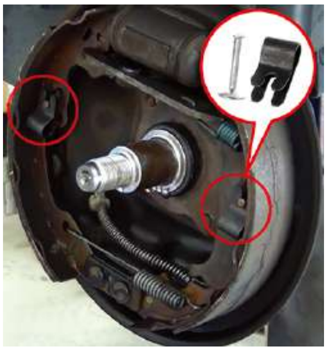
Door Hinge Remover & Installer Set
Applicable: VW, Audi, Seat, Skoda, Mercedes, Renault.
Bits size: M8, M10, M12, T30, T40, T45, T50

MERCEDES

TC59449

Brake Spring Pliers

- Suitable for Mercedes A-Class (e.g. A140), Citroen, Renault, Peugeot with Lucas drum brake on the rear axle.
Also used on Land Rover, Ford, Honda, etc.
- To remove or install the brake shoes, the brake shoe retaining spring must be pre-tensioned.



TC59467

Universal Valve Spring Compressor Tool

Applicable for 1-12 cylinder engines -two up to four - valve technology, in-line-engines or V-engines.
- This tool permits renewal of valve-stem oil-seals with the cylinder head removed or cylinder head assembled.
- The retaining flanges are rotatable, so that they may be affixed to the cylinder head lengthways, sideways, or diagonally.
- The correct height of the supporting rod may be adjusted due to the adjustment spindles on the left and right side, to achieve the correct angle between handle and the pressure piece for compressing the valve-spring.

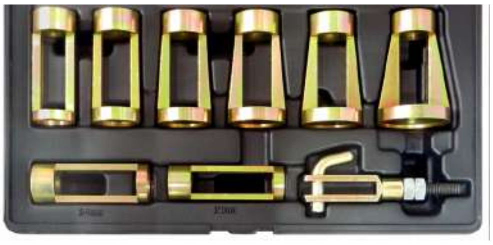
- Moveable rests allow infinitely adjustment of the tool length and therefore an universal application for 1-12 cylinder engines

Press Piece

21mm	Peugeot; Citroen HDI
24mm	VW/Audi; Seat; Smart & Opel
25mm	Hyundai
28mm	Toyota & Ford 16V
32mm	Opel & Peugeot
34mm	BMW; VW & Peugeot (diesel)
35mm	Renault; Mazda; Peugeot 106 & Mercedes M102/ M104
42mm	Ford

MERCEDES

TC59467A



Universal Valve-Spring Compressor Tool
1-Adaptor
8-Valve Caps：
Ø21-24-25-28-32-34-35-42MM

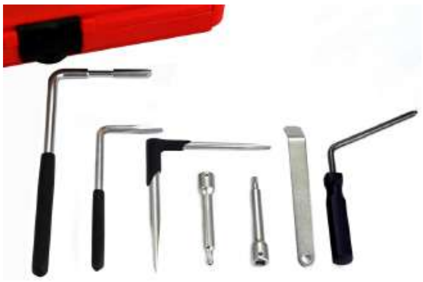
Press Piece

21mm	Peugeot; Citroen HDI
24mm	VW/Audi; Seat; Smart & Opel
25mm	Hyundai
28mm	Toyota & Ford 16V
32mm	Opel & Peugeot
34mm	BMW; VW & Peugeot (diesel)
35mm	Renault; Mazda; Peugeot 106 & Mercedes M102/ M104
42mm	Ford

TC59476

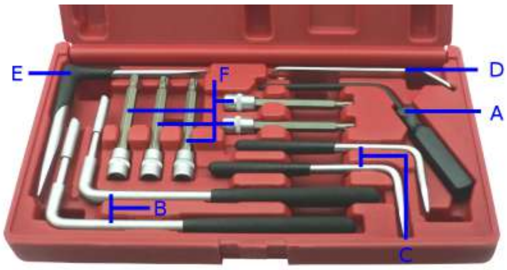
Driveshaft Tie Pliers
Applicable on Audi, BMW, Chrysler, Ford, GM, Honda, Mazda, Mercedes, Nissan, Opel/Vauxhall, VW, etc.
* For crimping driveshaft bellows ties.
* Suitable for Oetiker fittings.

TC59497



7Pc. Air Bag Removal Tool Kit
A seven piece tool kit for removing air bags on Volkswagen/Audi, BMW and Mercedes.

TC59497-12



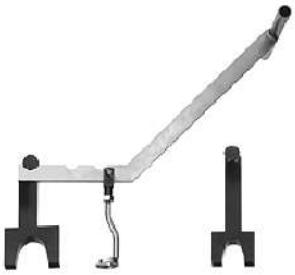
12Pc. Universal Tool For Expanding Air Bag Set
For the safe removal and installation of air-bag units in many popular cars

		Manufacturer	Model
A	Drivers Air Bag(x1)	Volkswagen	Passat, Jetta, Golf, Beetle, Bora
B	(x2)	Volkswagen, Audi, Skoda	Passat B5, Polo, Lupo, A4&A6;, Superb
C	(x2)	Volkswagen, Seat, Skoda	Golf F4, New Beetle , Fabla, Octavia
D	(x1)	Volkswagen	Golf F4, Passat, Bora
E	(x1)	Volkswagen	Passat
F	T30(x2)	Audi, Opel, Renault, VW, BMW, Mercedes, Opel	
F	T25(x2)	BMW	
F	5MM(x1)	Audi	

MERCEDES

TC59497A	**Air Bag Release Tool Kit** • Use to remove the air bag module from the steering wheel . • Work on many GM, Ford and Mercedes Benz vehicles . • Applications: Ford 2000-2004 Taurus/Sable, 1999-2003 Windstar VanGM 1999-2005 Chevrolet Impala, Lumina, Monte Carlo, Venture, Pontiac Bonneville, Grand Prix, Montana, Buick LeSabre, Century, Regal, Olds Intrigue, Cadillac El Dorado, Deville, STS,SLS Mercedes Benz Models 107,123, 124, 126, 129, 140, 163, 164, 170, 201, 202, 203, 208, 209, 210, 211, 215, 219, 220, 221 and 463.

TC59497A-3	**Air Bag Release Tool Kit** • Use to remove the air bag module from the steering wheel . • Work on many GM, Ford and Mercedes Benz vehicles . • Applications: Ford 2000-2004 Taurus/Sable, 1999-2003 Windstar VanGM 1999-2005 Chevrolet Impala, Lumina, Monte Carlo, Venture, Pontiac Bonneville, Grand Prix, Montana, Buick LeSabre, Century, Regal, Olds Intrigue, Cadillac El Dorado, Deville, STS,SLS Mercedes Benz Models 107,123, 124, 126, 129, 140, 163, 164, 170, 201, 202, 203, 208, 209, 210, 211, 215, 219, 220, 221 and 463.

TC59499A	
Valve Spring Compressor For Mercedes engines M102 and M103 with single camshaft to change the valve seal without removing the cylinder head. The tool does not apply to model 190 E 2.3-16	

TC59548	
Glow-Plug Connector Pliers(straight) To remove stubborn and awkward to reach Glow-Plug connectors, found on the latest generation of engines. e.g. Mercedes, BMW, VW-Audi etc.	

TC59509	**Cylinder liner puller with support brace** Wet heavy-vehicle (e.g. Daimler Benz, MAN) cylinder liners, automobile and stationary-engine liners, and other parts may be extracted using this puller. Operation: The spindle of the support brace is screwed into the clamping nut of the puller, and the puller inserted into the liner. The support brace is placed on to the cylinder block. Due to the newlydeveloped spreading system, when the spindle is turned, all three jaws spread quickly and without difficulty, until they are firmly seated beneath the edge of the liner. Then the nut of the support brace is tightened. Suitable for Cylinder liners with Ø 60 - 160 mm

MERCEDES

TC59558

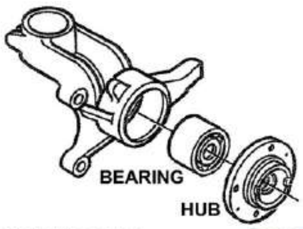
Glow-Plug Connector Pliers(angled)
To remove stubborn and awkward to reach Glow-Plug connectors , found on the latest generation of engines.
e.g. Mercedes, BMW, VW-Audi etc.
* Version angled at 90°

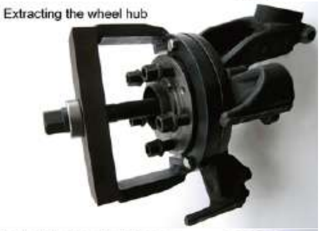
TC59593

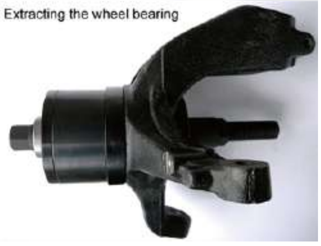
Wheel Hub and Bearing Master Kit

The TC59593 is the only equipment designed to accurately and efficiently Extract or Install Hubs and singular Wheel Bearings of spindle assemblies. It will tackle Front, Rear or All Wheel Drive vehicles with independent suspension and equipped with a solid roller ball bearing. The application is strictly for wheel assemblies where power is applied from the motor to the wheels, equipped with independent suspension and use a Singular Solid Roller Bearing at that wheel. It's unit on the market to "track arrow straight" when properly assembled on the vehicle under load. It tackles most front wheel drive Asian, European, and some Domestic vehicles and within its exclusive design the only unit to tackle Rear wheel drive European vehicles.
Applicable:
Rear Wheel Drive = BMW, Mercedes, Porsche.

Front Wheel Drive =
European - VW, Audi.
American - Chrysler, Ford, Saturn
Asian - Toyota / Lexus, Nissan / Infiniti, Honda / Acura, Mazda, Hyundai / Kia




Extracting the wheel hub

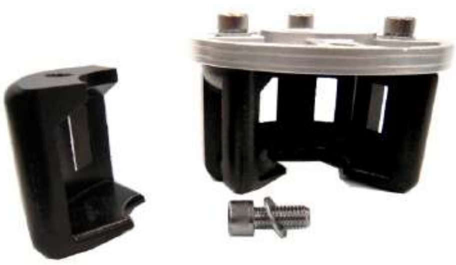

Extracting the wheel bearing

TC59607A

Hose Clip Pliers
With locking ratchet
(German Utility Model)
For removal and replacement of Fuel-lines, Oil-lines, Radiators Hoses and Heater Hoses fitted with space-saving, re-usable, self-clamping spring hose clips. Special design ensures that the compressed clips are safely and securely retained.
For Alfa Romeo, Citroën, Fiat, Ford, Hyundai, Lancia, Mercedes, Opel/Vauxhall, Peugeot, Porsche, Renault, Seat, Skoda, Toyota, Volvo, etc. especially for the new Clips on fuel-lines on VW-Audi.
Following makes of Hose Clips require these Pliers: Norma , ABA (AWAB), MIKALOR and MUBEA etc.

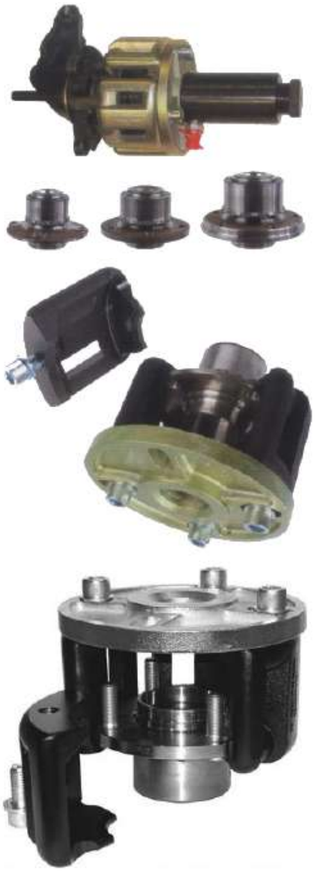
MERCEDES

TC59619

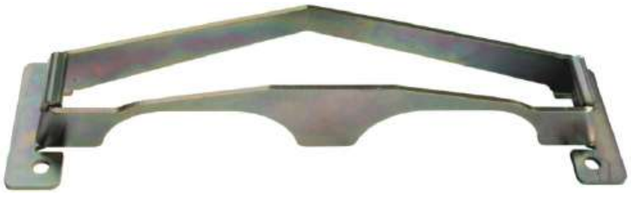


Mounting tool compact bearing

Universal tool for mounting the new type of compact wheel bearings, with or without locking ring. It's adjustable to fit future bearing sizes and all current VW Lupo, Polo, Transporter 5, Touareg, Audi A2, Seat Cordoba, and Skoda Fabia. Volvo V50/S40, V70/S80 and XC60. Ford Focus, C max, Mondeo, S-Max and Kuga. Mazda 3, 5, 6 and CX-7. Landrover Freelander 2. Mercedes Vito and Sprinter. Mitsubishi Colt and Smart Forfour with this type of bearing.



TC59633



Mounting Device for Timing Chain
(For the 4-cylinder Mercedes petrol engine M111)

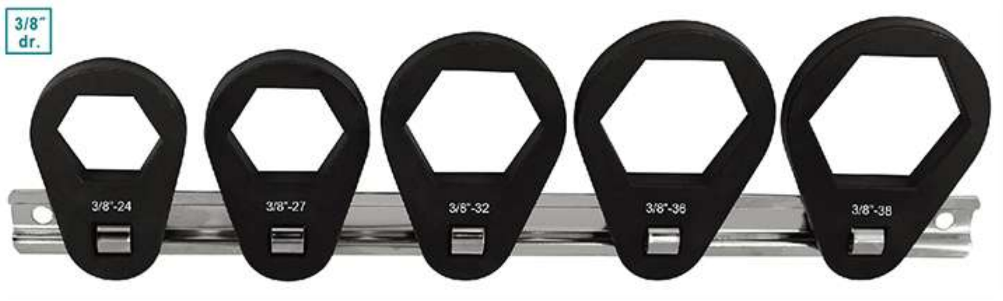
The use of this mounting device allows a single mechanic to replace a timing chain quickly and without any trouble.

Application:
C 180/200/220/230 ; E 200/230 ; CLK 200/230; SLK 200/230 ; ML 230

Advantages:
. Substantial time savings, only one mechanic required.
. No risk of the timing chain falling or skipping a tooth.
. Additional time savings on some vehicles where it is not necessary to remove the Radiator, Cooling Fan, etc.

MERCEDES

TC59663



Oil Filter Offset Wrench Set (5pcs)

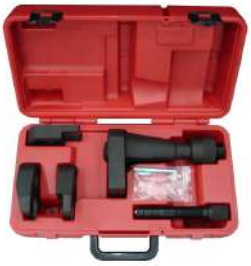
Features:
- 24mm/27mm/32mm/36mm/38mm with 3/8" square driver
.
- Low profile design with offset drive.
- Special design for tight confined areas.
- For oil filters where access is limited.

2014 New A3 1.8T Sportback

Size	Brand	Model
24mm	BMW	N62 5/7 Series
27mm	Mercedes-Benz	A-Class
27mm	Ford	Fiesta 1.4/1.6 TDCi
27mm	Renault	1.5/1.9/2.2/2.5dci
27mm	BMW	Mini
27mm	Ford	Transit 2.2/2.4/3.2
32mm	Vauxhall/Opel	Astra-G/Corsa-B
32mm	Volkswagen	Polo 1.2/Transporter T5 1.9
32mm	Audi	A6 3.2 TSi V6
32mm	Ford	Transit 2.0/2.4
32mm	Chevrolet	HHR/Cobalt/Cobalt SS/Malibu/Cavalier/S10/Malibu, Maxx
32mm	Saturn	L-series/lon/Vue
32mm	Pontiac	G6/Solstice/Sunfire/Grand AM
32mm	Oldsmobile	Alero
32mm	GMC	Sonoma
32mm	SAAB	9-3
36mm	Mercedes-Benz	220d/E220d/M604/C250d/E250d/M605/E300d/M606 MB/MB Transporter M616 116MB/100 Transporter
36mm	BMW	M52 3 Series/5 Series M60 6cyl/5/7/8 Series M73 12 cyl 7/8 Series
36mm	Vauxhall/Opel	Vectra-B di 16v
36mm	Volkswagen	Transporter T5/Lupo 1.2 TDi/Toureg TDi
38mm	Vauxhall/Opel	Astra | Zafira 2.0/2.2 dti

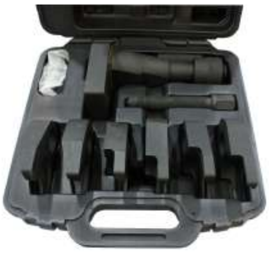
MERCEDES

TC59670A



Universal Truck Ball-Joint Extractor
With three interchangeable forcing forks for universal application to eccentric rods and tie rods on nearly all makes of vehicles, e.g., DAF, Iveco, MAN, Mercedes, Skania, Volvo, etc.
Opening C : 25 - 32 - 48 mm

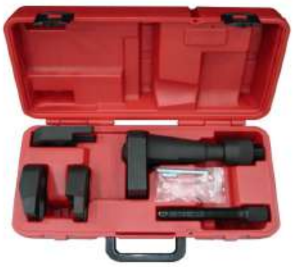
TC59670AB



Universal Truck Ball-Joint Extractor
With three interchangeable forcing forks for universal application to eccentric rods and tie rods on nearly all makes of vehicles, e.g., DAF, Iveco, MAN, Mercedes, Skania, Volvo, etc.
Opening C : 25，32，40，48，50，57 mm

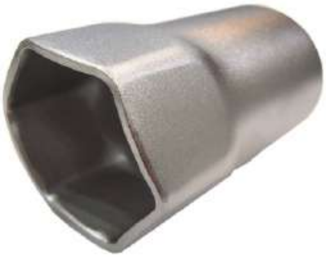
MERCEDES

TC59670B



Universal Truck Ball-Joint Extractor
With three interchangeable forcing forks for universal application to eccentric rods and tie rods on nearly all makes of vehicles, e.g., DAF, Iveco, MAN, Mercedes, Skania, Volvo, etc.
Opening C : 40，50，57 mm

TC59689



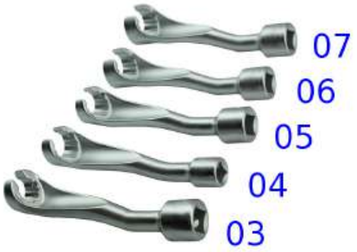
Special wrench
ideal for accurate tightening with a torque wrench(23Nm)
Application:
Mercedes Benz trucks for the AD-Blue filter (Filter associated with the Abgasreingung)
Audi/VW TDI V6-

Motor

L= 90MM
□ 3/8"
⬡ sw46

MERCEDES

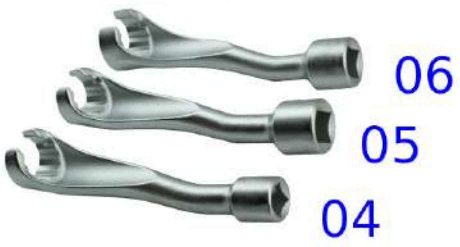
TC59697D



Injection Line Socket
•Open 12-point socket for the operation of screwed connections on injection lines.
• On MAN commercial vehicles with D 20 engines – Common Rail injection systems.

Part No.	Drive	S*L(mm)	Description
TC59697D-03	3/8" □	17*115	For BMW diesel engines and OPEL 2.5TD engines
TC59697D-04	1/2" □	14*119	For injection lines e.g. on BMW, VW
TC59697D-05	1/2" □	17*119	• For injection lines on MERCEDES-BENZ 100, 130, 314, 360, 360h, 352a, 346/355, 401, 402, 403, 407h, 615, 616, 617 • Long style
TC59697D-06	1/2" □	19*119	• For injection lines on MERCEDES-BENZ M 352, A, 346/ 355, A ,401, 402/ 422, LA, 403, 407h, as well as for the dip stick guide tube on M 314 • Long style
TC59697D-07	1/2" □	18*119	For All diesel engines

TC59697D-3PCS



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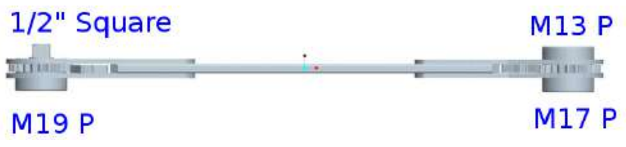
TC59697D-05	1/2" □	17*119	• For injection lines on MERCEDES-BENZ 100, 130, 314, 360, 360h, 352a, 346/355, 401, 402, 403, 407h, 615, 616, 617 • Long style
TC59697D-06	1/2" □	19*119	• For injection lines on MERCEDES-BENZ M 352, A, 346/ 355, A ,401, 402/ 422, LA, 403, 407h, as well as for the dip stick guide tube on M 314 • Long style

MERCEDES

TC59777-D



Import Serpentine Belt Wrench

- Designed to release the tension on spring-loaded idler pulleys.
- Allow direct access to the tensioner without having to remove engine accessories or frame components.
- Ratcheting wheels allow easy positioning of the wrench to allow access the tensioner from any angle.
- Rotate the drive end to match the position of serpentine belt tensioner.
- Heat treated and nickel chrome plated for durability, appearance and long tool life.

13mm or 1/2"	Hex	Volkswagen 2.0 liter
17mm	Hex	Audi 2.2, 2.8 liter; Mercedes
19mm or 3/4"	Hex	Mercedes
1/2"	Square	Volvo 2.3, 2.4, 2.8, 2.9 liter

TC59778A

Hose Clips Pliers (Chrome Plated)
For releasing and re-fitting reusable hose clips, types CLIC and CLIC-R (Caillau/Serflex).
Application: Audi, Citroën, Fiat, Mercedes, Opel/Vauxhall, Peugeot , Renault, VW etc.

TC59778B

Hose Clips Pliers (Phosphate Coated)
For releasing and re-fitting reusable hose clips, types CLIC and CLIC-R (Caillau/Serflex).
Application: Audi, Citroën, Fiat, Mercedes, Opel/Vauxhall, Peugeot , Renault, VW etc.

TC59788

Hose Clip Pliers With Locking Ratchet
For replacement of hose-clips on Fuel-lines, Oil-pipes and water-hoses, self-tensioning spring-clips. Special design allows the spring hose clips to be securely gripped and safely expanded.
Suitable for Alfa Romeo, Audi, Citroën, Fiat, Ford, Hyundai, Lancia, MAN, Mercedes, Opel/ Vauxhall, Peugeot, Porsche, Renault, Seat, Toyota, VW, Volvo, etc.

MERCEDES

TC59797

Diesel Injector Seat Cutter Set

•Identify injector "blow-by" exists (see previous page for possible symptoms).
•Gain access to the injectors and remove them.
•Select required reamer onto pilot post and tighten internal hex screw.
•Place assembled cutter into injector recess.
•Using the T bar and socket supplied apply only a small amount of pressure whilst turning the cutter in a clockwise direcyion only. Use a small amount of light lubricant whilst performing the cut to reduce chattering and help give a flat cut. Do not over cut the seat only remove enough metal to form a good seat.
•Thoroughly clean the seat and remove all swarf.
•Fit injectors as per manufacturers instructions.
Kit contents:
•TC59797-01-15*19mm Flat Reamer for Universal injector.
•TC59797-02-17*17mm Flat Reamer for Delphi/Bosch injectors (BMW/PSA/Renault/Ford).
•TC59797-03-17*19mm Flat Reamer for Bosch injectors (Mercedes CRD).
•TC59797-04-17*21mm Angled Resmer for Fiat/Iveco.
•T handle*1.
•Pilot post*1.
MATERIAL：CR-V

TC59797-5

Diesel Injector Seat Cutter Set

•Identify injector "blow-by" exists (see previous page for possible symptoms).
•Gain access to the injectors and remove them.
•Select required reamer onto pilot post and tighten internal hex screw.
•Place assembled cutter into injector recess.
•Using the T bar and socket supplied apply only a small amount of pressure whilst turning the cutter in a clockwise direcyion only. Use a small amount of light lubricant whilst performing the cut to reduce chattering and help give a flat cut. Do not over cut the seat only remove enough metal to form a good seat.
•Thoroughly clean the seat and remove all swarf.
•Fit injectors as per manufacturers instructions.
Kit contents:
•TC59797-01-15*19mm Flat Reamer for Universal injector.
•TC59797-02-17*17mm Flat Reamer for Delphi/Bosch injectors (BMW/PSA/Renault/Ford).
•TC59797-03-17*19mm Flat Reamer for Bosch injectors (Mercedes CRD).
•TC59797-04-17*21mm Angled Reamer for Fiat/Iveco.
•TC59797-05-17mm Angled for Fiat/Iveco, Ford
•T handle*1.
•Pilot post*1.
MATERIAL：CR-V

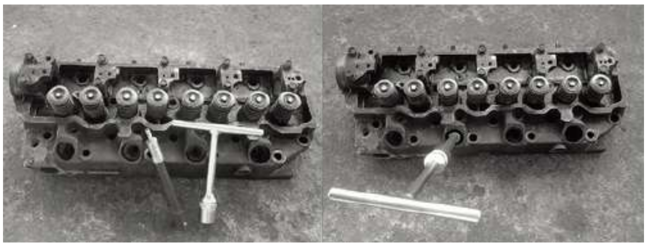
TC59797-8

Diesel Injector/Injector Seat Cleaner Set

Used to clean injector / injector seat when changing injector. Helps to avoid blow - back due to poorly seated injector. Suitable for a wide range of vehicles.

Content

Pilot post		
T-handle		
Reamer (flat)	15 x 19 mm	Various vehicles
Reamer (flat)	17 mm	Bosch / Delphi (BMW, Ford, PSA, Renault)
Reamer (flat)	17 x 19 mm	Bosch (Mercedes CRD)
Reamer (angled)	17 mm	Fiat, Iveco, Ford, Mercedes CDI
Reamer (angled)	17 x 21 mm	Fiat, Iveco
Reamer	18 x 21 mm	Various vehicles
Reamer	20 x 21 mm	Various vehicles
Reamer (long)	15.5 mm	Bosch
Cleaner	19 mm	Injector cleaner
Hex key		



MERCEDES

TC59797AA

Diesel Injector Seat Cutter Set
•Identify injector "blow-by" exists (see previous page for possible symptoms).
•Gain access to the injectors and remove them.
•Select required reamer onto pilot post and tighten internal hex screw.
•Place assembled cutter into injector recess.
•Thoroughly clean the seat and remove all swarf.
•Fit injectors as per manufacturers instructions.
Kit contents:
•15*19mm Flat Reamer for Universal injector.
•17*17mm Flat Reamer for Delphi/Bosch injectors (BMW/PSA/Renault/Ford).
•17*19mm Flat Reamer for Bosch injectors (Mercedes CRD).
•17*21mm Angled Resmer for Fiat/Iveco.
•Pilot post*1.

TC59797AA-5

Diesel Injector Seat Cutter Set
•Identify injector "blow-by" exists (see previous page for possible symptoms).
•Gain access to the injectors and remove them.
•Select required reamer onto pilot post and tighten internal hex screw.
•Place assembled cutter into injector recess.
•Thoroughly clean the seat and remove all swarf.
•Fit injectors as per manufacturers instructions.
Kit contents:
•15*19mm Flat Reamer for Universal injector.
•17*17mm Flat Reamer for Delphi/Bosch injectors (BMW/PSA/Renault/Ford).
•17*19mm Flat Reamer for Bosch injectors (Mercedes CRD).
•17*21mm Angled Resmer for Fiat/Iveco.
•17mm Angled for Fiat/Iveco, Ford
•Pilot post*1.

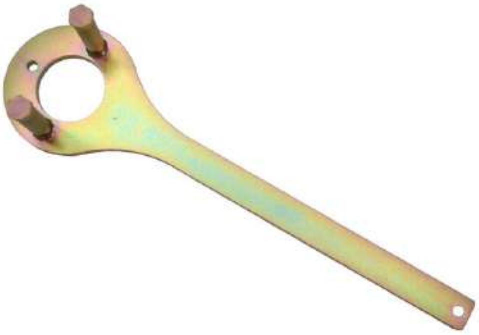
TC59808

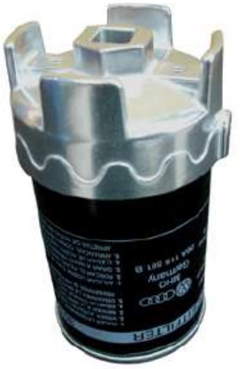
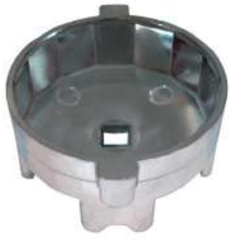
Earless Clamp Pliers-Extra Heavy Duty
For tightening of clamps (system OETIKER) on cv boots, water and fuel hoses.
Suitable for Audi, BMW, Chrysler, Ford, GM, Honda, Mazda, Mercedes, Nissan, Opel/Vauxhall, VW etc.
Advantages:
* No damage to spring band clamps.
* No damage to hoses.
* Easy and quick replacement of hoses.

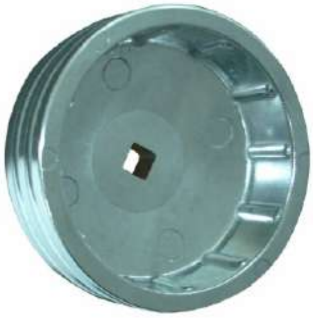
TC59825

Wiper-Arm Puller Set
Suitale for: VW-Audi, BMW, Ford, Mercedes, Opel, Peugeot, etc.
The first universal Puller Set to remove bolted Windscreen Wiper Arms, especially for those which have become rusted or corroded onto the drive-shaft.
Stubborn and deep-seated Wiper Arms may be quickly and easily removed using the TC59825 Puller Set.
Wiper Arms with integrated Screen-Wash nozzles - e.g. VW-Audi, BMW etc. on the rear window - can be easily removed by using the Slide hammer included in the Set.
Wiper Arms with central holes may be removed by using the Pressure Spindle. Those Wiper Arms with no central hole require the Pressure Bolt to be used with the Pressure Adaptor supplied.
Contents:
* 6 grippers
* 1 Pressure spindle
* 1 slide hammer

MERCEDES

TC59920	**Crankshaft Pulley Holder** * Suit for BENZ M111, 112 * Brake loose the crank shaft pulley/harmonic balancer bolt. Designed to properly secure the pulley from rolating during R & R of crank bolt. The 50mm hex head armature slips past the lightest of spaces and slides right into the center slot on the pulley. Then slide the long bar onto the receiving end of the armature and lock it into position with the securing bolt .
	

TC59928-3	Drive: SW 22 mm 
	
Oil Filter Wrench Applicable on VW-Audi, BMW, Citroën, Fiat, Ford, Lancia, Mazda, Mercedes, Nissan, Opel /Vauxhall, Peugeot, Porsche, Renault, Suzuki , Toyota, etc. Especially suitable for Audi A3 TDI, VW Golf IV TDI, BMW E36 with 4-cylinder engines, Porsche Cayenne, Boxster, 911 and Mercedes CDI engines, as well as C- and E-Class with 4- and 6-cylinder petrol engines. For Oil Filter with 74mm and 14 Flats.	

TC59928-7	**Oil Filter Wrench** Applicable for VW-Audi, Mercedes, Seat, Škoda etc. Especially suitable for Mercedes with 6-cylinder petrol engine M102 and M103. Due to the particularly compact oil filter wrench design, the oil filter on Mercedes M102 and M103 engines can be exchanged without the need to remove the induction pipe. For Oil Filter with Ø 76mm and 12 Ribs. Drive: 3/8“ □
	

MERCEDES

TC59928-12	**Oil Filter Wrench 74mm x 14 flutes** Wrench for gasoil to immersion. Aluminium Filter wrench in 3/8"D for use on Audi BMW,Citroen,Fiat,Ford,Lancia,Mazda, Mercedes,Nissan,Peugeot,Renault,Suzuki, Toyota,Vauxhall/Opel and Volkswagen. 14 sides Ø 74mm

TC59928-14	
Oil Filter Wrench VOLVO& Mercedes Benz, etc. 16 sides Ø 87mm	

TC59946	
CV Boot Clamp Pliers * For axle collar clamps on passenger cars, e.g. on VW-AUDI, OPEL, BMW, MERCEDES-BENZ, HONDA, NISSAN, MAZDA * With lug holding-down device. * Special Steel. * Surface nickel-plated.	

TC59956A	**Tube Blocking Pliers** For releasing and re-fitting the re-usable hose clips types CLIC and CLIC-R. Suitable for VW-Audi, Citroën, Mercedes, Opel/ Vauxhall, Peugeot, etc.

TC59956B	**Tube Blocking Pliers** For releasing and re-fitting the re-usable hose clips types CLIC and CLIC-L. Suitable for VW-Audi, Citroën, Mercedes, Opel/ Vauxhall, Peugeot, etc.

MERCEDES

TC59956E

Hose Clamp Pliers (Swivel Jaws)

- Open and close easily by turning the pliers by 180°.
- For clamping multi-use CLIC -type hose clamps.
- Swivel jaws - for use in areas with restricted access.
- Suitable for: Audi, Citroen, Fiat, Mercedes, Opel / Vauxhall, Peugeot, Renault, SMART, VW, etc.

TC59973

Stretch Belt Tool Kit

- Kit for mounting and dismounting the stretch belts without damaging pulleys and belts.
- Fast, easy and correct belt replacement.
- Large field of work through different mounting and dismounting tools.

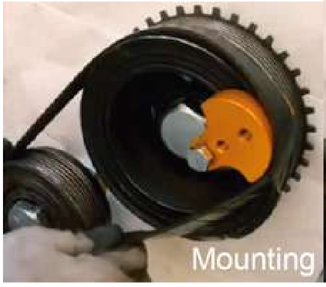
For: BMW, Cadillac, Chevrolet, Chrysler, Citroen, Fiat, Ford, GMC, Isuzu, Iveco, Lancia, Lincoln, Mazda, Mercedes, Peugeot, Volvo, etc.

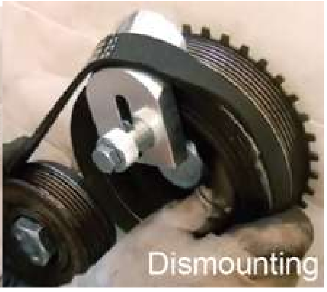
Mounting

1	Belt Installer	(ø 32 mm)
2	Belt Installer	(ø 45 mm)
3	Belt Installer	(ø 50 mm)
5.1	Screw	(M8x25, ø5.9mm)
5.2	Screw	(M8x40, ø5.7mm)
5.3	Screw	(M8x53, ø5.7mm)
5.5	Screw	(M8x65, ø5.6mm - L = 32.5)

Dismounting:

4.1	Belt Remover	
4.2	Self Locking Nut	
4.3	Fixing Nut	(M8)
5.4	Screw	(M8x65, ø5.6mm - L = 11.5)
5.5	Screw	(M8x65, ø5.6mm - L = 32.5)





TD59300A

8 PCs Special Socket Set

Service: Mercedes, BMW, VW, GM, Audi, Ford, Honda, Mazda, Nissan, Mitsubishi, Toyota vehicles.

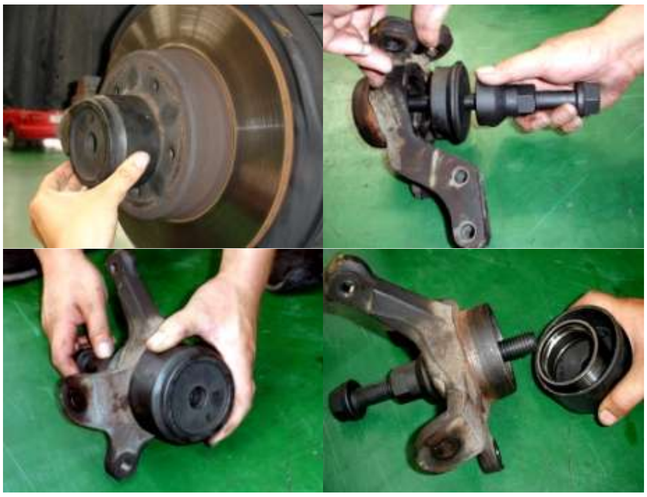
MERCEDES

TD59475

European Door Hinge/ Handle Kit
Finally, a compact solution to accessing the special fasteners found on the door hinges & door handles of VW/Audi , Mercedes-Benz and Porsche. Includes 4 door hinge bits (less than 1 inch long) with slender ratcheting wrench and extra long drivers for accessing Mercedes and VW door handle fasteners.

* Ratchet
* T-20 T-handle Driver
* T-30 Torx Screwdriver
* T40 Bit
* T45 Bit
* 4MM 12 Point Bit
* 8MM 12 Point Bit
* 10MM 12 Point Bit

TD59745



Mercedes Benz Rear Wheel Bearing Remover & Installer
This precision machined tool is used for removing and replacing the rear wheel bearing found on Mercedes Benz rear axles. This tool is also used for the installation of the rear axle flange.
Suits Mercedes Benz models:
W124, W201, W202, W208, W210.
Bmw models:E30, E36, E46.

TD59785

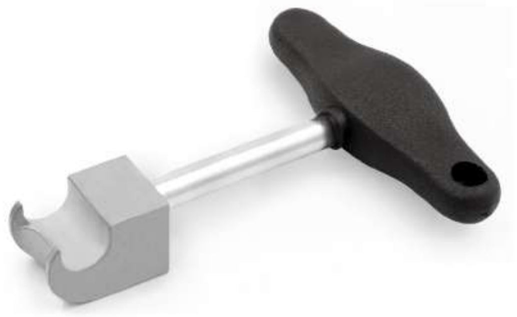
Benz Camshaft Lock Set
W/A djustable 38mm Wrench
* 38 mm special wrench for turning the cam. Used with M112-0132
* Application: M112, M113
* Camshaft Spanner
* Camshaft Locking Tool RH
* Camshaft Locking Tool LH

MERCEDES

TE5920 	**Mercedes & BMW Ignition Lock Set** Complete kit for removal and installation for Mercedes and BMW motor vehicles. Stored in a plastic case. Includes: * 2 x Instrument cluster removal hooks for models: 107, 116, 123, 124, 126, 140 & 201. * 2 x Radio removal tools for 1992 and newer Mercedes vehicles Models: 140, 129, 202 & 210. * 2 x Ignition lock removal tools for models W124 & 201 . * 2 x Ignition lock removal tools for models W124, 126 & 201. TE59A.B.C Tool Set

TE5920AB 	**Mercedes & BMW Ignition Lock Set** Complete kit for removal and installation for Mercedes and BMW motor vehicles. Includes: * 2 x Instrument cluster removal hooks for models: 107, 116, 123, 124, 126, 140 & 201. * 2 x Ignition lock removal tools for models W124 & 201. * 2 x Ignition lock removal tools for models W124, 126 & 201.

TE5920B		TE5920C	
Instrument Cluster Tools Pair of hooks for removing instrument cluster on Mercedes 107, 116, 123, 124, 126, 140 & 201.		**Radio Removal Tool** To radio removal on 1992 and newer Mercedes. Applicable: Models 140, 129, 202 & 210.	

TF5916B22 	**Hose Clamp Removal Tool** * Universally designed for the loosening / opening of HENN clamps as found on coolant hoses / charge air hoses in passenger cars. * Suitable for VW-Audi, Seat, Skoda, BMW, Peugeot, Citroen, Dacia, Fiat, Ford, Kia, Lexus, Mazda, Mercedes, Nissan, Opel/Vauxhall, Porsche, Renault, Toyota, Volvo etc.

MERCEDES

TF5917B03

Windshield Washer Nozzles Adjustment Tool (Mercedes)
* For adjusting the fan washer nozzles for the window cleaning system.
* Suitable for Mercedes W204, W207, W212, W218.
OEM Ref.: 001 589 02 16 00

TF59495-05

Trim Reomval Wedge (Mercedes)
Used to remove various trim parts from Mercedes-Benz without damaging the parts.
OEM Ref.: 110 589 03 59 00

TF59663Z

Oil Filter Offset Wrench Set (5 pcs)
Features:
* 24mm / 27mm / 32mm / 36mm / 38mm with 3/8" square driver.
* Low profile design with offset drive.
* Special design for tight confined areas.
* For oil filters where access is limited.

24mm:
* BMW N62 5/7 Series

27mm:
* Mercedes-Benz A Class
* Ford Fiesta 1.4/1.6 TDCi
* Renault 1.5/1.9/2.2/2.5dci
* BMW Mini
* Ford Transit 2.2/2.4/3.2

32mm:
* Vauxhall/Opel Astra-G / Corsa-B
* Volkswagen Polo 1.2 / Transporter T5 1.9
* Audi A6 3.2 TSi V6
* Ford Transit 2.0/2.4
* Chevrolet HHR / Cobalt / Cobalt SS / Malibu / Cavalier / S10 / Malibu, Maxx
* Saturn L-series / Ion / Vue
* Pontiac G6 / Solstice / Sunfire / Grand AM
* Oldsmobile Alero
* GMC Sonoma
* SAAB 9-3

36mm:
* Mercedes-Benz
220d / E220d / M604 / C250d / E250d / M605 / E300d / M606 MB / MB Transporter M616 116MB / 100 Transporter
* BMW M52 3 Series / 5 Series M60 6cyl / 5/7/8 Series M73 12 cyl 7/8 Series
* Vauxhall/Opel Vectra-B di 16v
* Volkswagen Transporter T5 / Lupo 1.2 TDi / Touareg TDi

38m:
* Vauxhall/Opel Astra | Zafira 2.0/2.2 dti

TF591780L

Camber Adjusting Tool (VW / Mercedes)
For camber adjustment on VW Crafter, Mercedes Sprinter.
For the extremely hard-to-access shock absorber screw connection.

ToolMaster

MERCEDES

TF5917801

Belt Tensioner Tool (Mercedes)
Effectively compresses hydraulic belt tensioner on Mercedes W169 and W245 (alternator with start-stop function).

A-Class (W169)		
A 150	169.031, 169.331	2004~2012
A 160	169.031, 169.331	2009~2012
A 170	169.032, 169.332	2004~2012
A 180	169.032, 169.332	2009~2012
A 200	169.033, 169.333	2004~2012
A 200 turbo	169.034, 169.334	2005~2012

B-Class (W245)		
B 150	245.231	2005~2011
B 160	245.231	2009~2011
B 170	245.232, 245.233	2005~2011
B 170 NGT	245.232, 245.233	2008~2011
B 180	245.232, 245.233	2009~2011
B 180 NGT	245.232, 245.233	2008~2011
B 200	245.233	2005~2011
B 200 turbo	245.234	2005~2011

OEM Ref: W266589003100 / A2662000770 / A2662001170

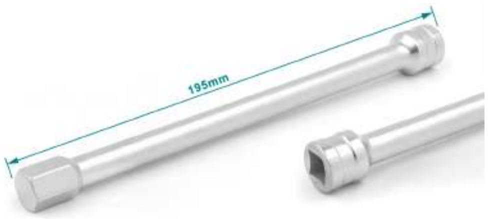
TF59151009

2 in 1 Design
Brake pad
Tire tread

Tire Tread Depth & Brake Pad Thickness Gauge
Used for measuring thickness of brake pad and depth of tire tread.

OEM Ref: T40139A (VW) / 341260 (BMW) / 211589062300 (Benz)

TF59160810



Headlight Adjusting Wrench (Mercedes)
For adjusting the headlights or clearance from bumpers and bonnet on Mercedes C-Class (W205) 2014~. Audi A7.
The wrench is especially suited to areas with very restricted access.

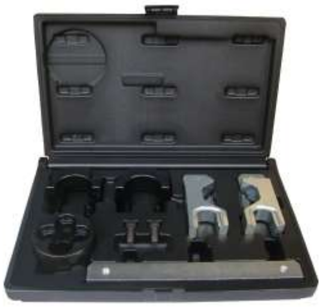
TF5917808Z

M14 x P1.25
M14 x P1.5
M12 x P1.25
M12 x P1.5

Wheel Stud Pilot Pin Set
* To easily remove and install the wheel on many vehicles.
* The wheel stud pilot pin allows you to hang the wheel without having to balance the wheel on the small lip of the hub .

Application:
M12 x P1.25: Alfa Romeo, Chrysler, Dodge and Fiat.
M12 x P1.5: Audi, Alfa Romeo, BMW, Mercedes, Mini, Porsche, Vauxhall, Volvo and VW.
M14 x P1.25: BMW and Mini.
M14 x P1.5: Audi, BMW, Citroen, Chrysler, Ferrari, Fiat, Ford, GM, Hyundai, Land Rover, Lamborghini, Opel, Mercedes, Peugeot, Porsche, Renault, Rover, Saab, Seat, Skoda, Vauxhall, Volvo, and VW.

TH5948375



ENGINE TIMING TOOL FOR Mercedes Benz

•Applications: Mercedes Benz M651 Chain driven 1.8/2.1 diesel engines
•Including: Mercedes Benz A Class ,B Class, C Class, E Class,GLK,M Class, SCLASS, Sprinter, Viano and Vito.

Q`TY: 5/12.25/12.6/0.77`
CARTON SIZE: 400*310*290MM

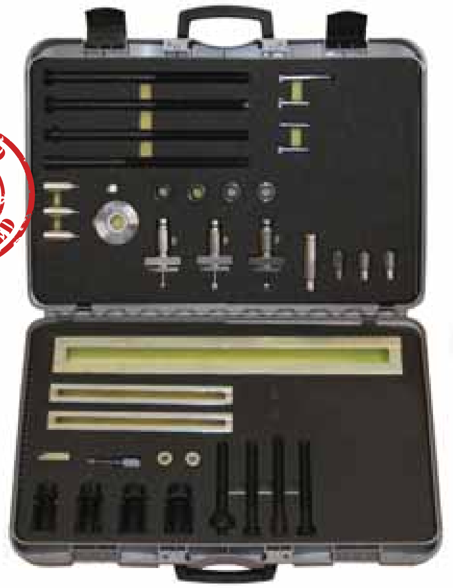
Mechanical kit

Universal injector kit.

- This system provides to lock the bridge-bar to the engine heads.

- Mercedes
- Renault
- Fiat
- Peugeot

- Injectors: Bosch, Siemens, Delphi
- Mechanical working



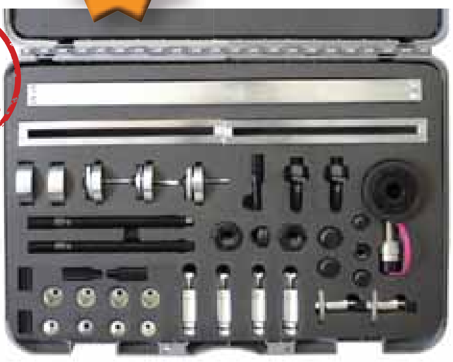
Mechanical kit (cylinder NOT supplied) **311 157 000**

Injectors extractor kit - UNIVERSAL

Complete set for injectors removal.

- Hydraulic cylinder: 12 Ton, 700 bar, 3/8" NPT F connection.
- Hydraulic & Mechanical working

THE PUMP TO BE USED WITH THE HYDRAULIC CYLINDER IS **NOT SUPPLIED**.



Injectors extractor kit **311 166 000**

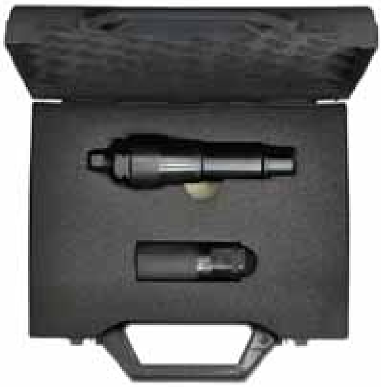
Injectors extractor kit - SSANGYONG

Complete set for removing Delphi injectors.

- Models: Ssangyong & MB
- Engine: CDI

- Models: Kia & Mazda
- Engine: Common Rail

- Socket: 21 mm - L = 90 mm



Injectors extractor kit **311 064 000**

Injectors extractor kit - MERCEDES

Complete set for injectors removal.

- This kit enables to remove two injectors simultaneously without dismounting valves cover.

- Mercedes: A-Class (old models till 2004), 169 (245 B), A-Class (new models up to 2004), Mercedes B-Class.

Engine
- 668, 640

PATENTED

Injectors extractor kit	**311 049 000**

NEW

Injectors extractor kit

Complete set for injectors removal. ENGINE REMOVAL NOT REQUIRED.

- This kit allows the removal of the tightly fixed injectors nozzles and the removal of all the injectors mounted on MB 2.1 L, 2.2 L, 3.0 V6 without dismounting the cylinder head.

- MB: Vito, Vario, CLK, Sprinter, Viano, Classe M, GL, C, GLK, E, CLS, S, R, G
- Chrysler: 300 C

Engine
- MB: 2.1 l, 2.2 l, 3.0 V6
- Chrysler: 3.0 V6

- Injectors: Bosch (2.1 l, 2.2 l), Delphi (3.0)
- Main body with extractor: M18x1,5 CH30
- Socket CH29 - L=78 - 1/2" connection
- Hex. wrench 10 mm for electrode removal

Injectors extractor kit	**311 171 000**

Injector puller - MERCEDES

Special injector extractor suitable for Mercedes and Bosch models, complete with a Socket for dismounting electrical connection.

- Mercedes: Sprinter, Vito, Viano, Vario.

Engine
- CDI

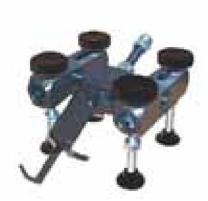
Injector puller	**311 032 000**

Injector puller - FIAT

Fiat injector puller.

- Fiat
- Alfa
- Opel
- Saab
- Suzuki

Engine
- Diesel JTD



Injector puller	**311 002 000**

Injector puller - FIAT

Complete set for removing injection nozzles.

- This kit allows the removal of the tightly fixed injectors nozzles, without dismounting the cylinder head. It is equipped with a „bridge system" and sliding bearing on it that grant a quick and easy injector's removal. The special screw has a double connection to fix inside and outside the injector.

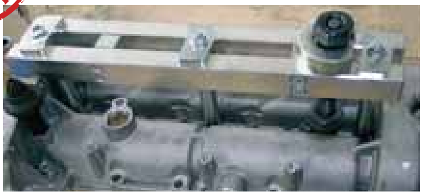
- Injectors: Bosch
- Groupe Fiat
- Engine: 1.3 MJ 16v
- Engine codes: 169A1.000, 188A8.000, 188A9.000, 199A2.000, 199A3.000, 223A9.000

- Alfa Romeo
- Engine: 1.3 MJ 16v

- Opel
- Engine: 1.3 CDTI
- Engine codes: Z13DTH, Z13DTJ, Z13DT

- Suzuki
- Engine: 1.3 DDiS 16v
- Engine codes: Z13DT

PATENTED



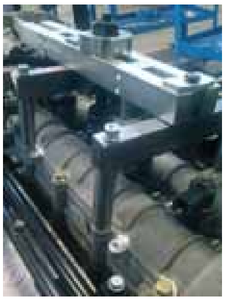
Injector puller	**311 083 000**

Complementary kit - FIAT

Complementary kit for removing injectors. TO BE USED with code 311083000.

- Fiat

Engine
- 1.6 MJ, 1.9 MJ, 2.0 MJ, 2.3 MJ, 3.0 MJ



Complementary kit - Fiat	**311 083 010**

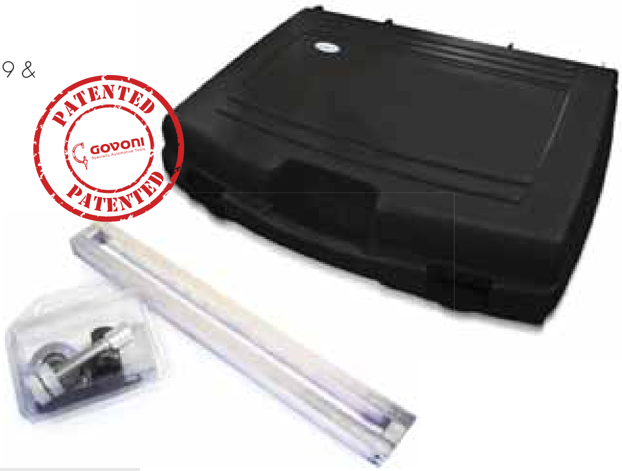
Injectors extractor kit - FIAT

Kit TO BE USED with code 311093000.

- Complete with main brige-bar, hex. wrench 10 mm and sockets CH.29 & CH.30.

- Iveco: Daily

Engine
- 2.3 L Common Rail, 3.0 L Common Rail EEV



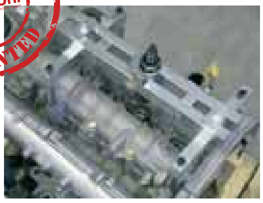
Injectors extractor kit	**311 143 000**

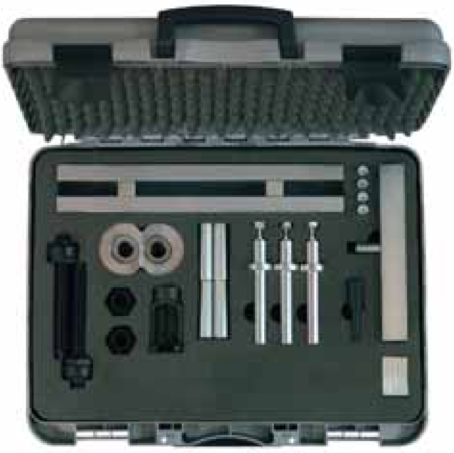
Injectors extractor kit - FIAT

Complete set for removing Injectors.

- Fiat
- Lancia
- Alfa Romeo
- Opel
- Suzuki

Engine
- 1.3 MJ 16v, 1.6 MJ 16v, 1.9 MJ 16v, 2.0 MJ 16v, 2.3 MJ, 3.0 MJ, 1.3 CDTI, 1.9 CDTI, 2.0 CDTI, 1.3 DDiS 16v, 1.9 DDiS 16v





Injectors extractor kit	**311 093 000**

Injectors extractor kit - BMW

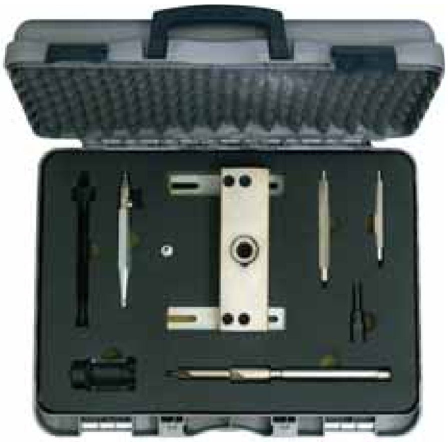
Complete set for removing injectors.

- This kit allows the removal of tightly fit injectors nozzles without removing the cylinder head and the injectors seat cleaning thanks to the supplied blower.

- BMW

Engine
- Common-Rail

Engine codes
- M47TU, M57 e M57TU



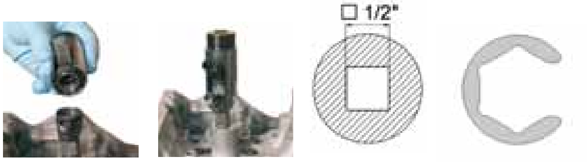
Injectors extractor kit	**311 055 015**

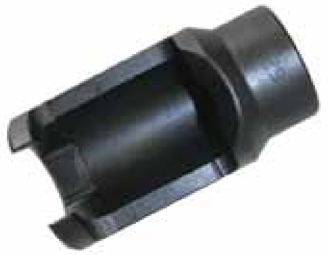
Injector removal socket

Special socket for removing injector electrical connector.

- Size: CH 29
- Length: 78 mm
- Connection: 1/2"

- Bosch





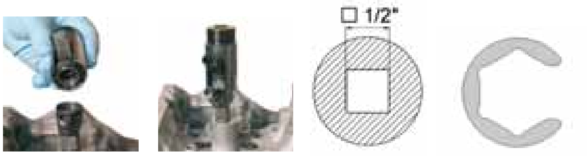
Bussola	**720 019 000**

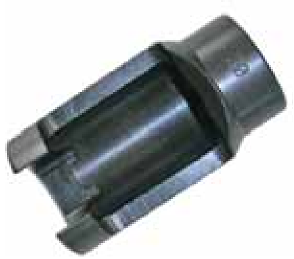
Injector removal socket

Special socket for removing injector electrical connector.

- Size: CH 30
- Length: 78 mm
- Connection: 1/2"

- Bosch





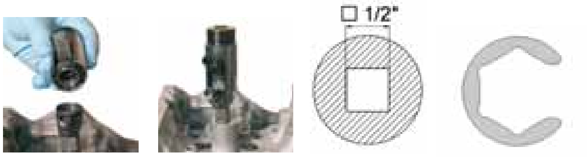
Injector removal socket	**720 020 000**

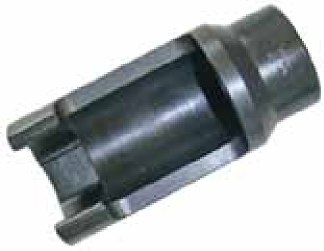
Injector removal socket

Special socket for removing injector electrical connector.

- Size: CH 25
- Length: 78 mm
- Connection: 1/2"

- Siemens





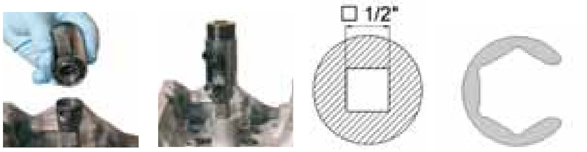
Injector removal socket	**720 021 000**

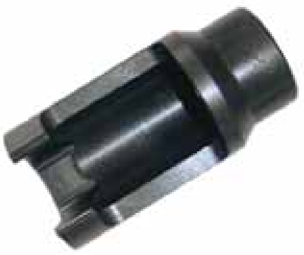
Injector removal socket

Special socket for removing injector electrical connector.

- Size: CH 27
- Length: 78 mm
- Connection: 1/2"

- Siemens





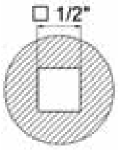
Injector removal socket	**720 022 000**

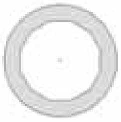
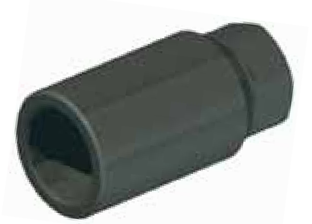
Injector removal socket

Special socket for removing injector electrical connector..

- Size: CH 28
- Length: 78 mm
- Connection: 1/2"

- Bosch



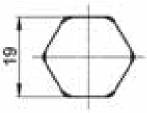
Injector removal socket	**720 023 000**

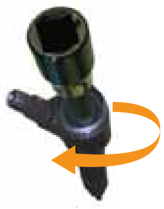
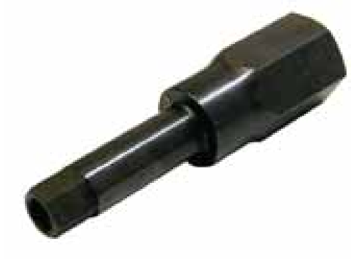
Tool for injector spindle - BOSCH

Special tool suitable for removing the injector spindle.

- Injectors: Bosch

- CH. 10 mm



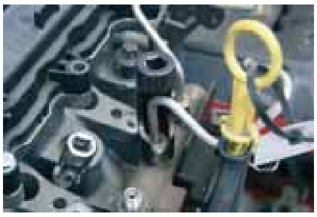
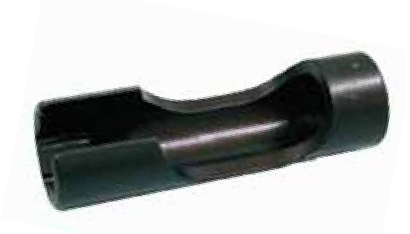
Tool for injector spindle	**311 026 040**

Injector pipe removal socket

Special socket for mounting and dismounting fuel injection pipe on diesel engines.

- Size: 17 mm
- Length: 80 mm
- Connection: 3/8""

Engine
- Diesel

Injector pipe removal socket	**311 104 000**

Injectors extractor kit - PSA

Complete set for removing PSA HDI injection nozzles.

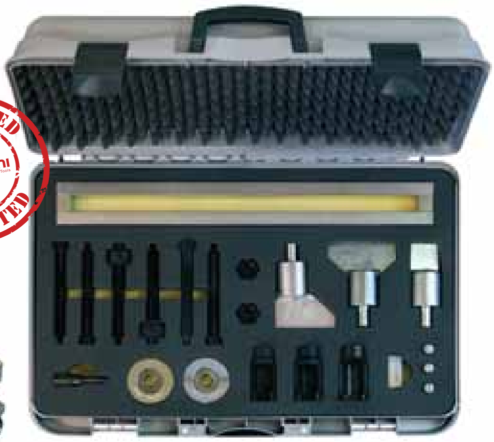
- This kit allows the removal of the tightly fixed injectors nozzles without dismounting the cylinder head. It is equipped with a bracket and 6 special screws that grant a quick and easy injectors removal. With this device injectors can be removed simultaneously.

- Injectors: Bosch, Siemens
- Peugeot
- Citroen
- Fiat e Lancia

Engine
- 2.0 HDI, 2.2 HDI

Engine codes
- **DW10**: RTH, RHW, 4HW, RHT, RHM, RHR, RHK
- **DW12**: 4HX, 4HZ, 4HW, 4HY, 4HT, 4HS, 4HP, 4HR, 4HN

PATENTED
GOVONI
PATENTED



Injectors extractor kit	**311 072 000**

Injectors extractor kit - PSA

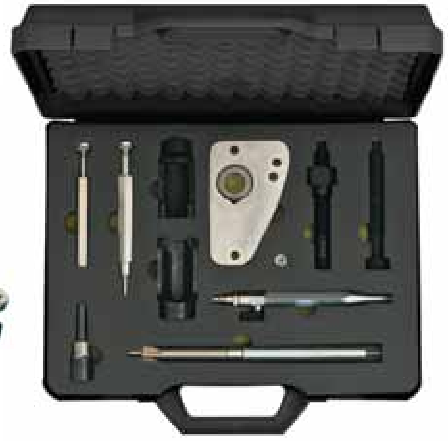
Complete set for removing PSA HDI injection nozzles.

- This kit allows the removal of tightly fit injectors nozzles without removing the cylinder head.

- Injectors: Bosch, Siemens

Engine
- PSA 2.0 (110, 135 PS) HDI DW10 e DW12

- Bridge-bar that fits perfectly PSA cylinder heads.
- Special screw system, that allows a fast and easy nozzles removal
- Blower to clean injectors seats



Injectors extractor kit	**311 056 014**

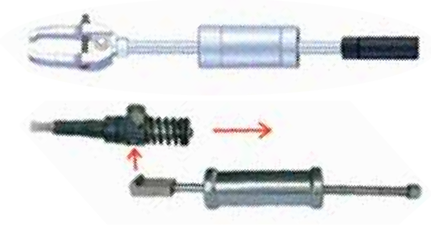
Injector puller - VAG

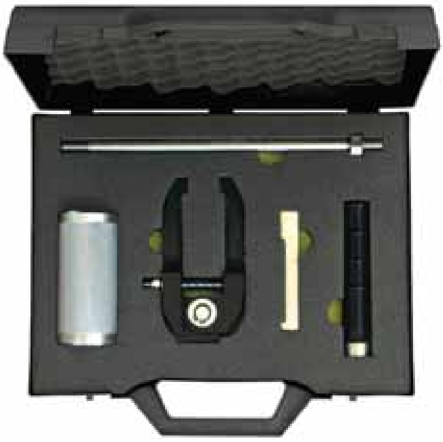
Special injectors puller.

- Complete with handle, slide hammer and a special vice clip.
- Specially designed for Injector Pump system.

- VW injector Pump System and traditional injectors

Engine
- TDI-PD





Injectors extractor kit	**311 050 006**

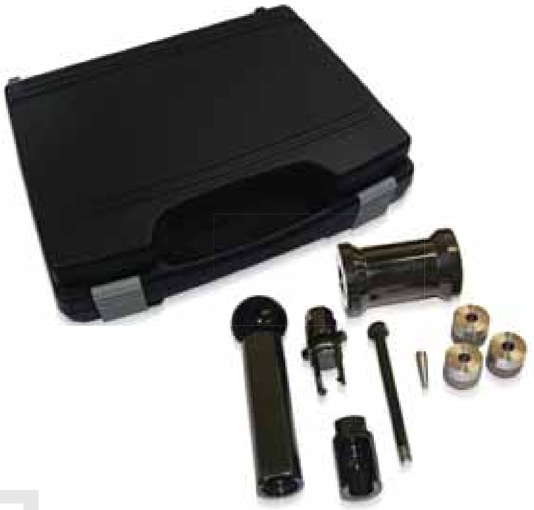
Injector puller - VAG

Injector puller.

- Complete set for removing high pressure **petrol** injectors mounted on the cylinder head, equipped with tools for the installation of the injectors seals.

- Injectors: Bosch
- VAG

Engine
- FSI



Injectors extractor kit	**311 141 000**

Injector puller - RENAULT

Complete puller suitable for Delphi injectors mounted on Renault.

- Injectors: Delphi
- Renault
- Nissan

Engine
- 1.5 dCi, less than105 hp

Injector puller	**311 071 000**

Injector puller - RENAULT

Complete set for removing Renault dCi injection nozzles.

- This kit allows the removal of the tightly fixed injectors nozzles without dismounting the cylinder head. It is equipped with a bracket and 6 special screws that grant a quick and easy injectors removal. With this device injectors can be removed simultaneously.

- Injectors: Bosch
- Renault/Nissan
- Opel

Engine
- 2.0 (solo Renault), 2.2, 2.5 dCi

Engine codes
- G9T, G9U

PATENTED

Injectors extractor kit	**311 070 000**

Injector puller - RENAULT

Complete set for removing Renault dCi and Master injection nozzles.

Updated with special supports for 2.0 Dci M9R engines.

- This kit allows the removal of the tightly fixed injectors nozzles without dismounting the cylinder head. It is equipped with a bracket, 2 special screws that grant a quick and easy injectors' removal and a special support to use on Renault Master engines. With this device the two injectors can be removed simultaneously.

- Injecotrs: Bosch CR, Bosch Piezo
- Renault
- Nissan
- Opel

Engine
- 2.0 (solo Renault), 2.2, 2.5 dCi

Engine codes
- G9T, G9U

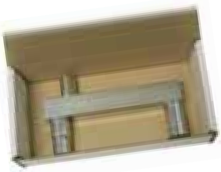
PATENTED

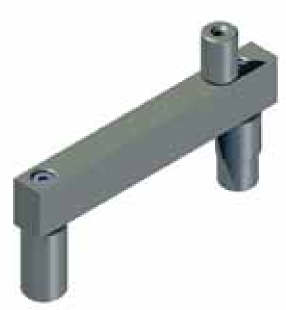
Injectors extractor kit	**311 090 000**

Support for injectors - RENAULT

Special body support for injectors removal on Renault Master.
TO BE USED with code 311070000

- Renault: Master





Support for injectors	**311 090 001**

Injector puller - RENAULT

NEW

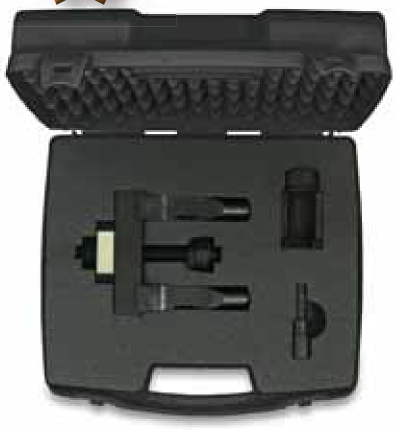
Complete set for removing injectors. ENGINE REMOVAL NOT REQUIRED.

- Injector removal with a mechanical screw system, to reduce the overall dimension of the tool.

- Injectors: Bosch
- Renault
- Nissan
- Opel

Engine
- 1.9 dCi

Engine codes
- F9Q



Injectors extractor kit	**311 140 000**

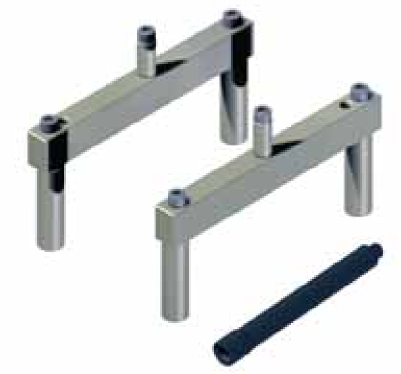
Support for injectors - RENAULT

Special engine supports. TO BE USED with code 311070000, 311166000, 311157000

- Renault Bosch Piezo

Engine
- 2.0 dCi

Engine codes
- M9R



Support for injectors	**311 110 000**

Injector seat cleaning kit - BOSCH

Set of tools suitable for injectors seat cleaning

- Injectors: Bosch
- Mercedes
- Volvo
- Ford
- Renault
- Kia
- Fiat
- Alfa
- Lancia
- Opel
- Suzuki
- VW

Engine

- CDI

Injector seat cleaning kit	**311 047 000**

Injectors extractor kit - BOSCH, DELPHI

Hydraulic kit for removing injecotrs.

- This kit can be used with all GOVONI injectors extractors equipped with supporting cross piece.
- After having carried out the procedure for mounting the cross piece/bridge connect the cylinder to the hydraulic pump and proceed to extraction of the injectors by acting on the pump controls. Ascertain that the cylinder does not encounter too much resistance in ascent; if this should occur, unload the cylinder, loosen the nut and repeat the procedure. Once the injector is extracted, remove screw and ring nut and dismount the other injectors by following the same procedure.

- Injectors: Bosch, Delphi
- Renault
- Nissan

- Connection: 3/8" NPT
- Power: 12 ton
- Stroke: 42 mm
- Dimensions: H 120, Ø 69 mm
- Pressure: 700 bar
- Weight: 2,8 Kg
- Hole: 20,2 mm

Injectors extractor kit	**311 116 000**

Injectors extractor kit - BOSCH, DELPHI

Universal complete set suitable for removing injectors.

- Injectors: Bosch e Delphi in genere
- Mercedes
- Volvo
- Ford
- Renault
- Kia
- Camion

- Body-tamper
- Long handle M18 - L = 450 mm.
- Short handle M18 - L = 350 mm.
- Upper handle
- Adapter M18-M22
- M18 „Fork" extractor
- Threaded insert
- M18 socket for Delphi
- M22 socket for Bosch

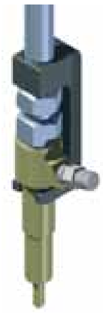
Injectors extractor kit	**311 026 000**

Injectors extractor kit - SIEMENS

Special kit suitable for removing Siemens injectors on diesel engines (to apply to slide hammer code 311 026 000).

- Injectors: Siemens
- Peugeot
- Citroën
- Ford
- Toyota

Engine
- 1.4 - 2.0 - 2.2 Diesel



Injectors extractor kit	**311 062 000**

Injectors socket - SIEMENS

Socket for Siemens Piezo, to use together with 311 026 000.

- Injectors: Siemens Piezo

- M27x1 - M18x1,5

Injectors socket	**311 072 010**

Joint

Universal joint TO BE USED with code 311026000.

- Ideal for working also in case of narrow places.

Joint	**311 026 039**

Socket M18

M18 socket TO BE USED with the code 311026000.

- Opel

Engine
- 2.2 Diesel

Socket M18	**311 026 031**

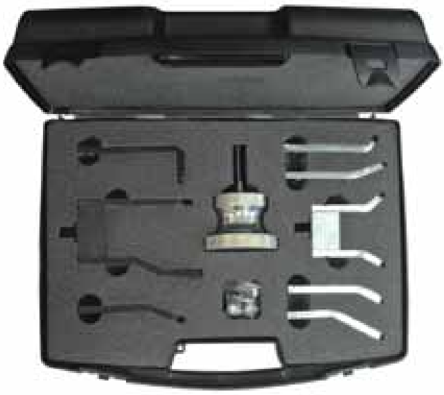
Injector puller - DENSO

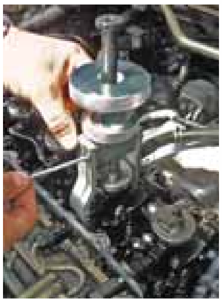
NEW

Injectors removal kit complete with hammer .

- System studied to remove injectors indipendently from the engines, where they are mounted, without removing the electrical connector. Carry out the removal operations by connecting the extractors to injector edges.

- Injectors Denso: 23670 - 30080, MB416600 - MB40A, 5870 - 13H50, 11L 12182





Injector puller	**311 169 000**

Injector puller - BOSCH, DELPHI

Special injector extractor suitable for new generation Trucks that mount Injector-Pump system, and for traditional truck injectors.

- Injectors: Bosch, Delphi
- Volvo
- Scania
- Mercedes
- Man
- Renault
- Iveco

Injector puller	**311 051 000**

Injector seat cleaning kit - BOSCH, SIEMENS

Set of tools suitable for Injectors seat cleaning.

- Injectors: Bosch
- Mercedes, Volvo, Ford, Renault, Kia, Fiat, Alfa, Lancia, Opel, Suzuki, VW
- Engine: CDI

- Injectors: Siemens
- Peugeot, Citroën, Ford, Toyota
- Engine: 1.4, 2.0, 2.2 Diesel

Injector seat cleaning kit	**311 047 014**

Injector seat cleaning kit - BOSCH, SIEMENS

Set of tools suitable for injectors seat cleaning.

- Injectors: Bosch
- Mercedes, Volvo, Ford, Renault, Kia, Fiat, Alfa,Lancia, Opel, Suzuki, VW
- Engine: CDI

- Injectors: Siemens
- Peugeot, Citroën, Ford, Toyota
- Engine: 1.4, 2.0, 2.2 Diesel

Injector seat cleaning kit	**311 047 017**

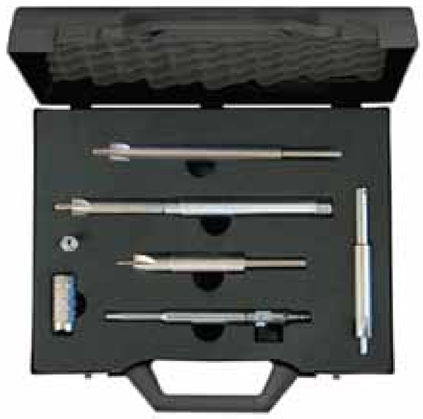
Injector seat cleaning kit - BOSCH, SIMENS, DELPHI

Set of tools suitable for Injectors seat cleaning.

- Injectors: Bosch
- Mercedes, Volvo, Ford, Renault, Kia, Fiat, Alfa,Lancia, Opel, Suzuki, VW
- Engine: CDI

- Injectors: Siemens
- Peugeot, Citroën, Ford, Toyota
- Engine: 1.4, 2.0, 2.2 Diesel

- Injectors: Delphi
- Renault, Mercedes, Kia



Injector seat cleaning kit	**311 047 025**

Injector edge cleaning tool - UNIVERSAL

Special tool for injector edge resurfacing.

- Injectors: Universal

Injector edge cleaning tool	**311 047 023**

Injector seat cleaning tool - DENSO

Special tool for injector seat resurgacing.

- Injectors: Denso
- Toyota
- Mazda
- Mitsubishi

- ∅ 17 - 19 mm

Injector seat cleaning tool	**311 112 000**

Injector seat cleaning tool - SIEMENS

Special tool for injector seat resurgacing.

- Injectors: Siemens

Engine
- 1.4, 1.6, 2.0, 2.2 HDI

Injector seat cleaning tool	**311 056 008**

Injector seat cleaning tool - BOSCH

Special tool for injector seat resurgacing.

🚗 ▸ Injectors: Bosch

! ▸ ∅ 15,5 mm

Injector seat cleaning tool	**311 047 016**

Injector seat cleaning tool - DELPHI

Special tool for injector seat resurgacing.

🚗 ▸ Injectors: Delphi

! ▸ ∅ 17 mm

Injector seat cleaning tool	**311 079 008**

Injector seat cleaning tool - BOSCH

Special tool for injector seat resurgacing.

🚗 ▸ Injectors: Bosch

! ▸ ∅ 17-19 mm

Injector seat cleaning tool	**311 078 015**

Injector seat cleaning kit - BOSCH

Injector seat resurgacing kit.

🚗 ▸ Injectors: Bosch

! ▸ ∅ 15,5-17-19 mm

Injector seat cleaning kit	**311 078 000**

Injector seat cleaning kit - SIEMENS, DELPHI

Injector seat resurgacing kit.

- Injectors: Siemens, Delphi

- ∅ 17 mm

Injector seat cleaning kit	**311 079 000**

Blowing tool

Special blowing tool for injector seat. TO BE USED with codes 311078000 & 311079000.

- Filetto: M10, M8

Blowing tool	**311 080 000**

Ring extractor

Copper sealing ring extractor.

- With this extractor is possible to remove copper sealing without damaging the cylinder head. Equipped with a performing slide hammer.

- For washers with holes ∅ 7 mm

Ring extractor	**311 076 000**

Ring extractor

Copper sealing ring extractor **specific for TRUCKS**.

- With this extractor is possible to remove copper sealing without damaging the cylinder head. Equipped with a performing slide hammer.

- Injectors: Bosch
- Scania
- Iveco
- Renault

- For washers with holes ∅ 10 mm

Ring extractor	**311 144 000**

Ring extractor

Special plier for removing copper sealing rings **specific for TRUCKS**.
TO BE USED with code 311076000 (Copper sealing ring extractor).

- For washers with holes ∅ 10 mm

Ring extractor	**311 076 024**

Hydraulic cylinder

NEW

Hydraulic cylinder.

- Device to be used for removing injectors, hubs, bearings and for all the other applications where it can be used, such as mechanical parts very tighten. Version with cylinder 12 ton, stroke 8 mm.

- Connection: 3/8" -18 NPT
- Power: 117'679,8 N
- Stroke: 8 mm
- Dimensions: ∅ 80x55 mm
- Pressure: 700 Bar
- Weight: 2,02 Kg
- Hole: ∅ 21,5

Hydraulic cylinder	**270 019 000**

Hydraulic cylinder

NEW

Hydraulic cylinder.

- Device to be used for removing injectors, hubs, bearings and for all the other applications where it can be used, such as mechanical parts very tighten. Version with cylinder 17 ton, stroke 70 mm.

- Connection: 3/8" -18 NPT
- Power: 166'713,05 N
- Stroke: 70 mm
- Dimensions: ∅ 90x155 mm
- Pressure: 700 Bar
- Weight: 5,12 Kg
- Hole: ∅ 20,4 mm

Hydraulic cylinder	**270 017 000**

Hydraulic cylinder

NEW

Hydraulic cylinder.

- Device to be used for removing injectors, hubs, bearings and for all the other applications where it can be used, such as mechanical parts very tighten. Version with cylinder 20 ton, stroke 8 mm.

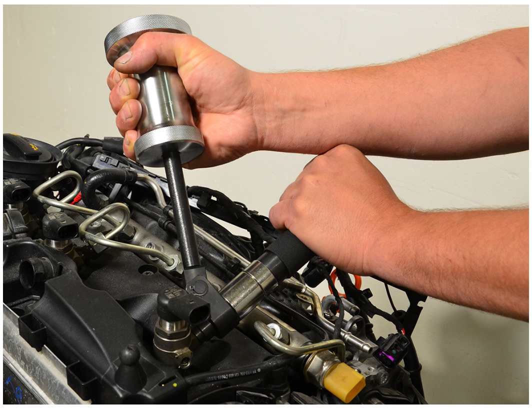
!

- Connection: 3/8" -18 NPT
- Power: 196'133 N
- Stroke: 8 mm
- Dimensions: ∅ 100x60 mm
- Pressure: 700 Bar
- Weight: 3,04 Kg
- Hole: ∅ 33 mm

Hydraulic cylinder	**270 020 000**

UNIVERSAL DIESEL INJECTOR PULLER

SAVES MONEY. DO NOT DAMAGE INJECTOR.

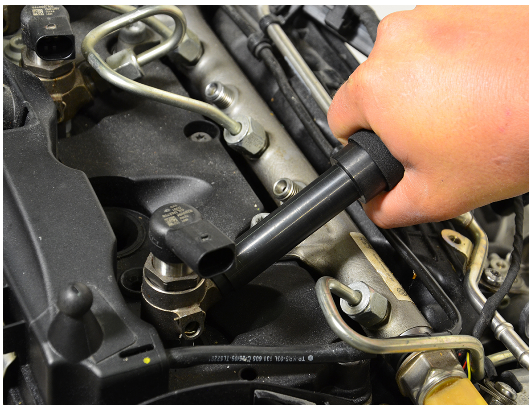


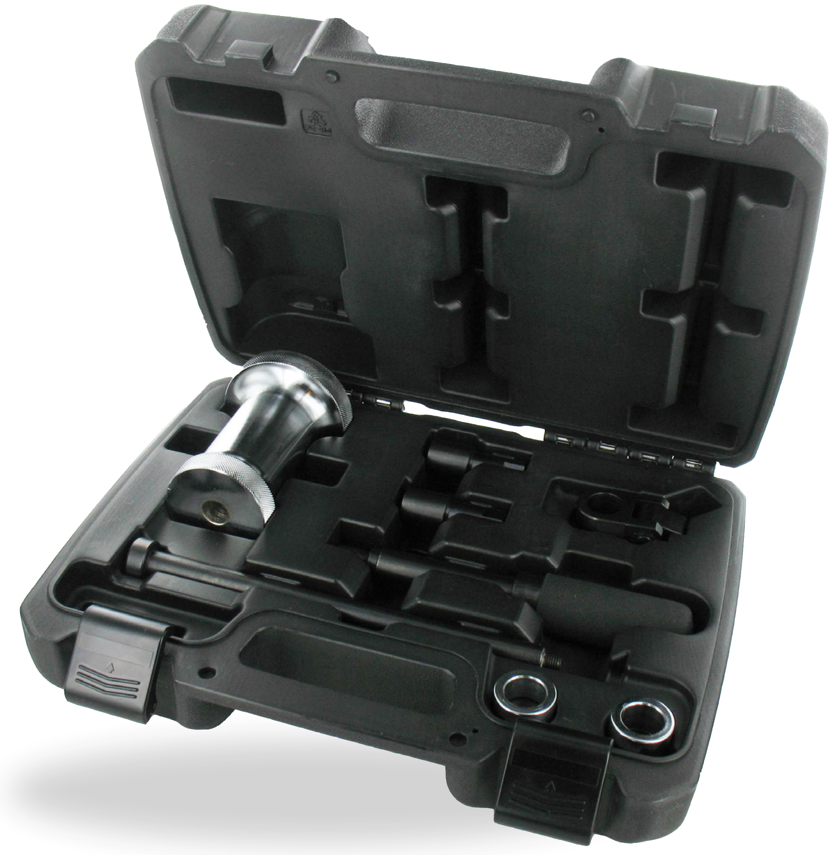
This extractor allows to dismantle Common rail or Piezo injector types for Denso, Siemens, Bosch & Delphi brands from 1999 to 2017.

The main idea is to fix the extractor instead of the Diesel inlet connection fitting thanks to an extra-strong threaded coupler which is exactly the same size as the original fitting.
This avoids the dismantling of the electrical part of the injector and the significant extra costs this involves and the trouble that goes with it (return to aftersales, 150€ per injector...).
If the fitting is undismantable you can use the two couplers included in the kit. They will wrap the fitting and come against the injector to form a consolidated and very strong whole.

The dismantling can be done in rotation fixing only the handle. It can also be done, for the most difficult cases, in rotation and axial extraction thanks to the sliding hammer.
The kit also includes two spacers to adjust distance between the injector axis and the sliding hammer.

This kit is totally universal and unique. It enables all types of moderately frozen or caked injectors to be removed without dismantling the electrical part, even on the latest vehicles.

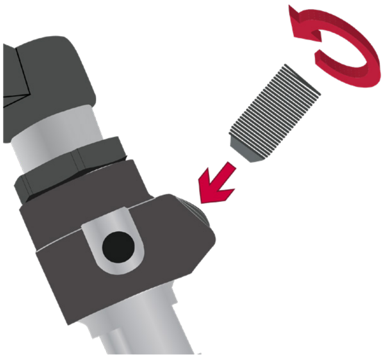




THE KIT INCLUDES:

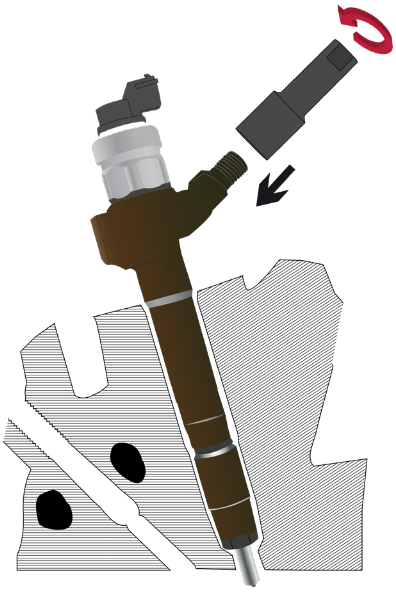
2 x extra-strong threaded couplers

For a perfect fit between handle and injector



1 x M12 coupler

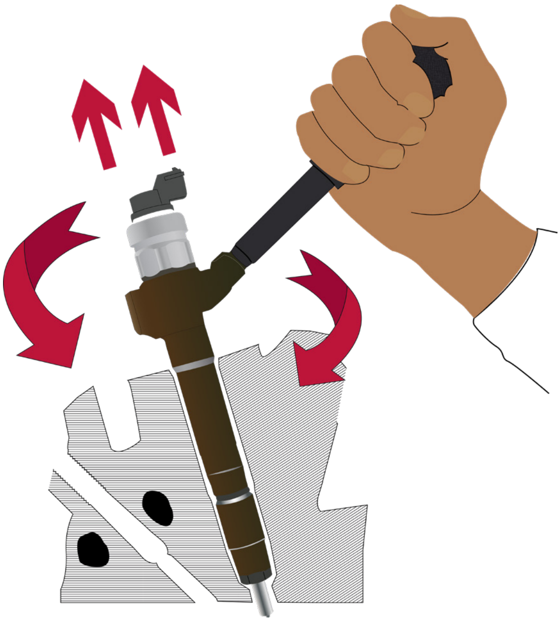
For older generation Common Rail Denso, Siemens, Bosch and Delphi when it is NOT possible to remove the coupler



1 x M14 coupler

For new generation Piezzo Denso, Siemens, Bosch and Delphi when it is NOT possible to remove the coupler

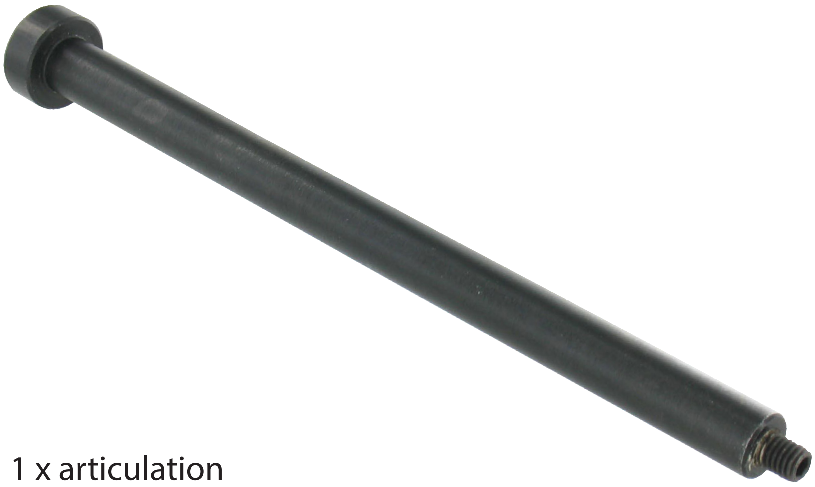
1 x rotation handle



THE KIT INCLUDES:

1 x sliding hammer

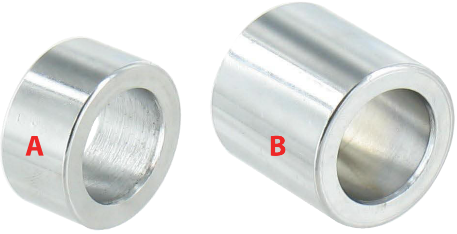
1 x drive-shaft

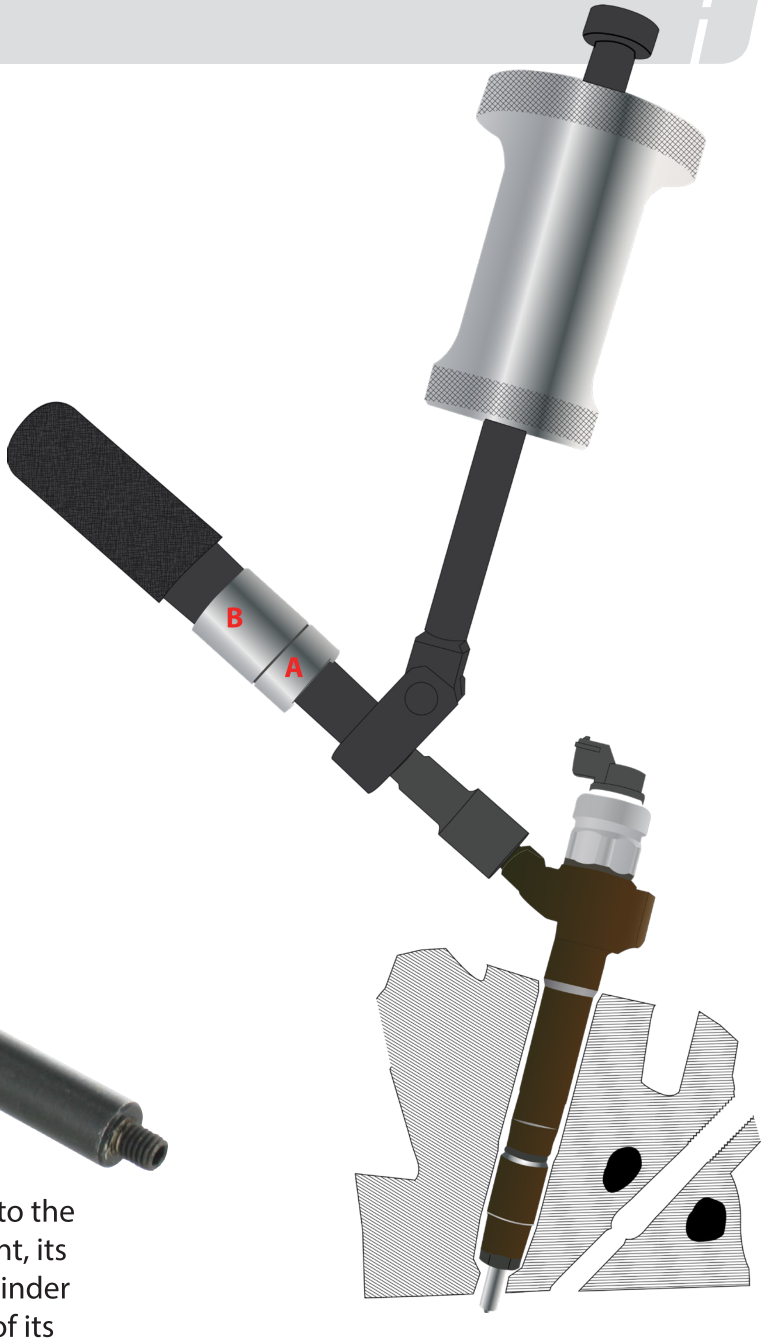


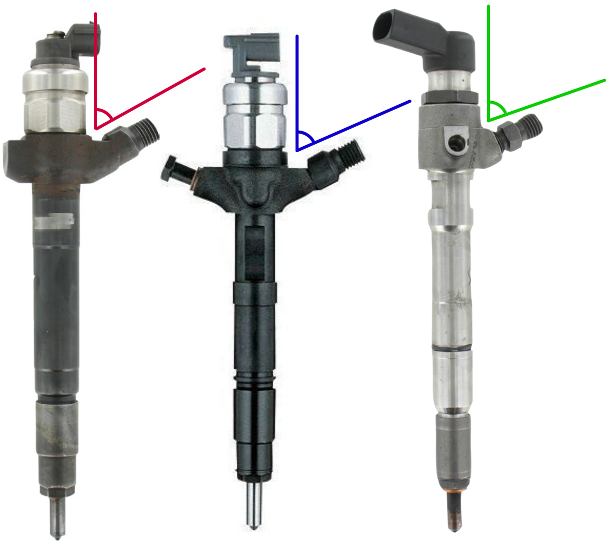
1 x articulation

Allows you to adapt to the injector environement, its disposition in the cylinder head and the angle of its Diesel inlet coupling

1 x 15mm spacer + 1 x 30mm spacer



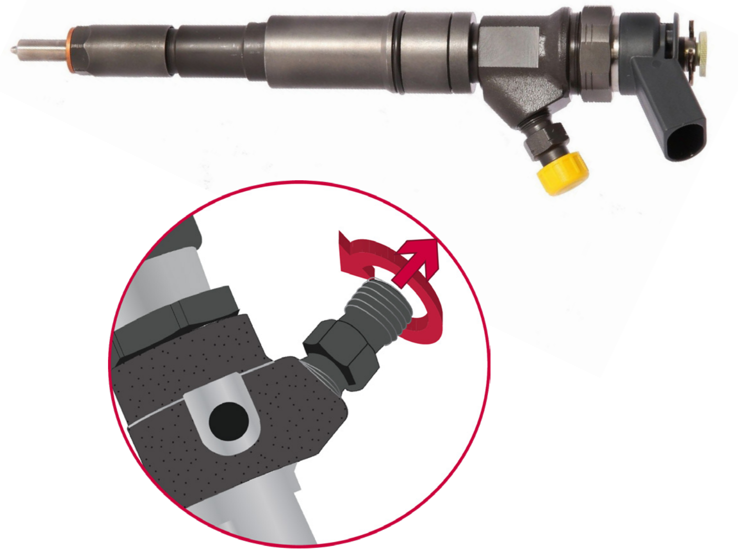




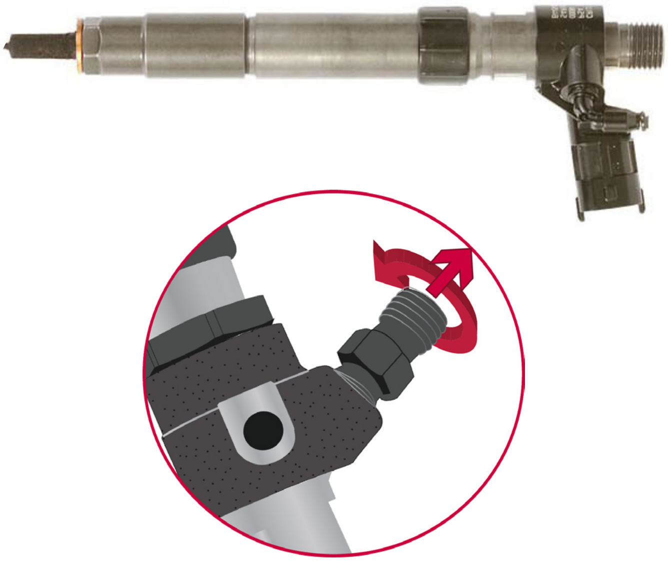
ADVANTAGES OF UNIVERSAL INJECTOR PULLER:

1. It is UNIVERSAL
   It works on all types and brands of Common Rail and Piezo injectors

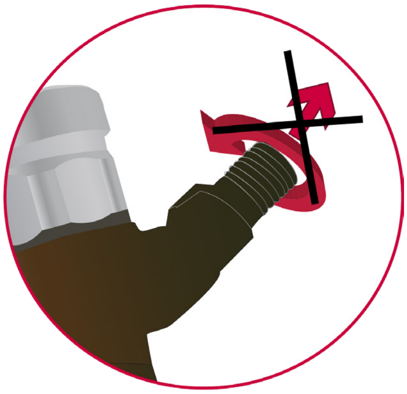
- older generation Common Rail Denso, Siemens, Bosch and Delphi



- newer generation Piezzo Denso, Siemens Bosch and Delphi that are dismantable

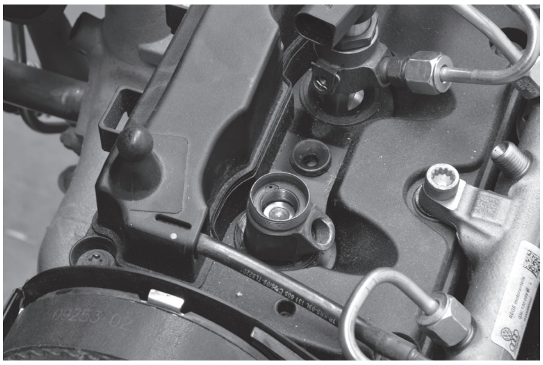


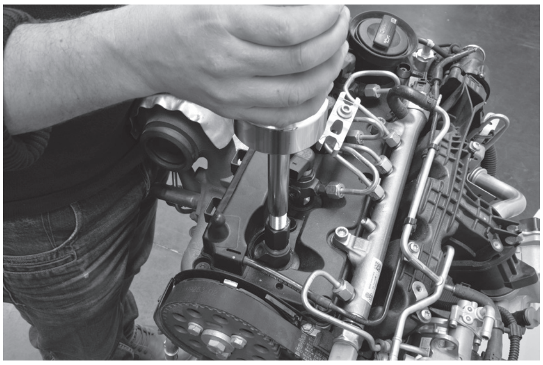
- new generation Piezzo Denso, Siemens Bosch and Delphi that are undismantable



2. It allows to work without the need of dismantling the electrical part

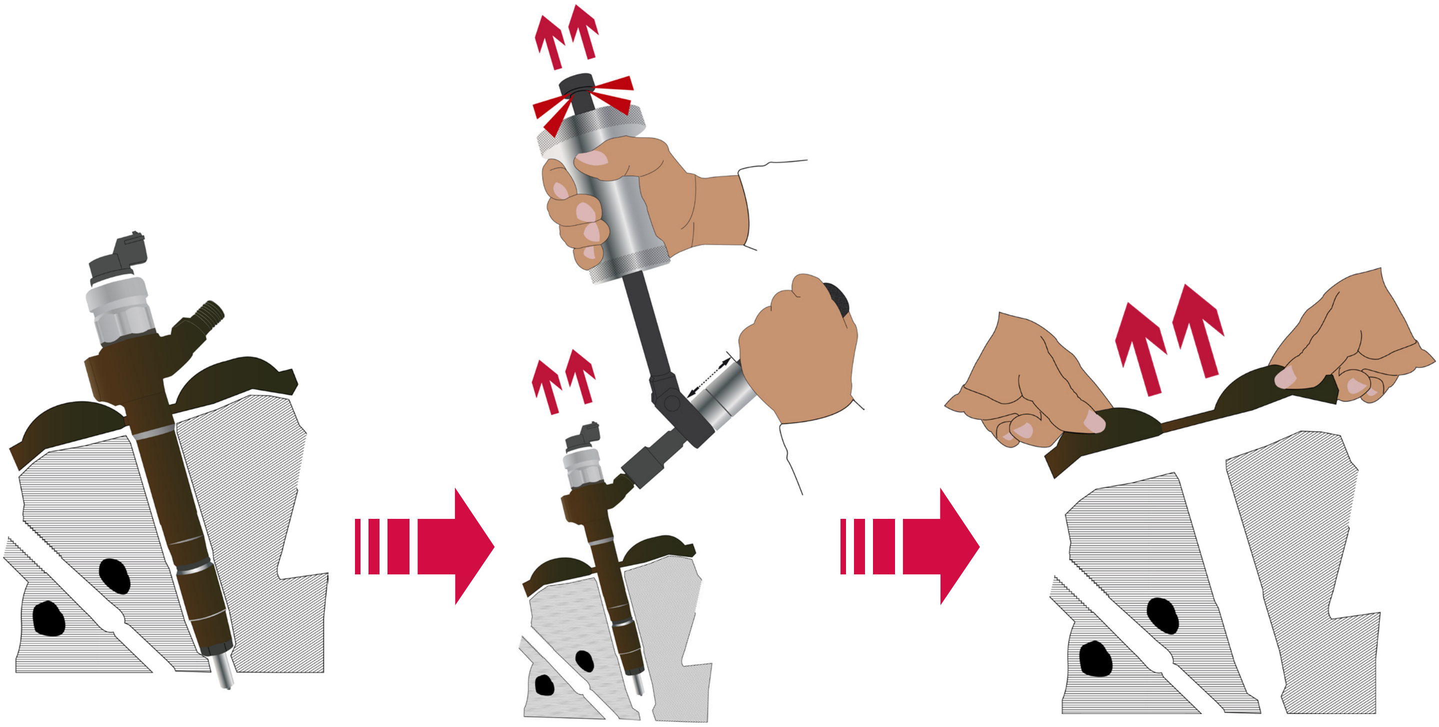
Prevents excessive extra costs!
When you have to dismantle the electrical part, like illustrated below, you can not put it back yourself afterwards. You need to send the dismantled injector back to the factory and it costs you approximately 150€ per injector in aftersales.





3. Removal of valve cover

On modern engines, a lot of operations involve the removal of the valve cover.
This often means removing the 4 injectors beforehand.
With the universal injector puller, removing the valve cover becomes an easy task.



Quick math

- Removing the electrical part is 150€ per injector. Which means it will cost 600€ just for the injector to be fixed as a « collateral damage »

- Thanks to our system which doesn't require to remove the electrical part, you save 4 x 150€ = 600€ on a 4 cylinders engine

- Thinking this way, the profitability of the kit is great!

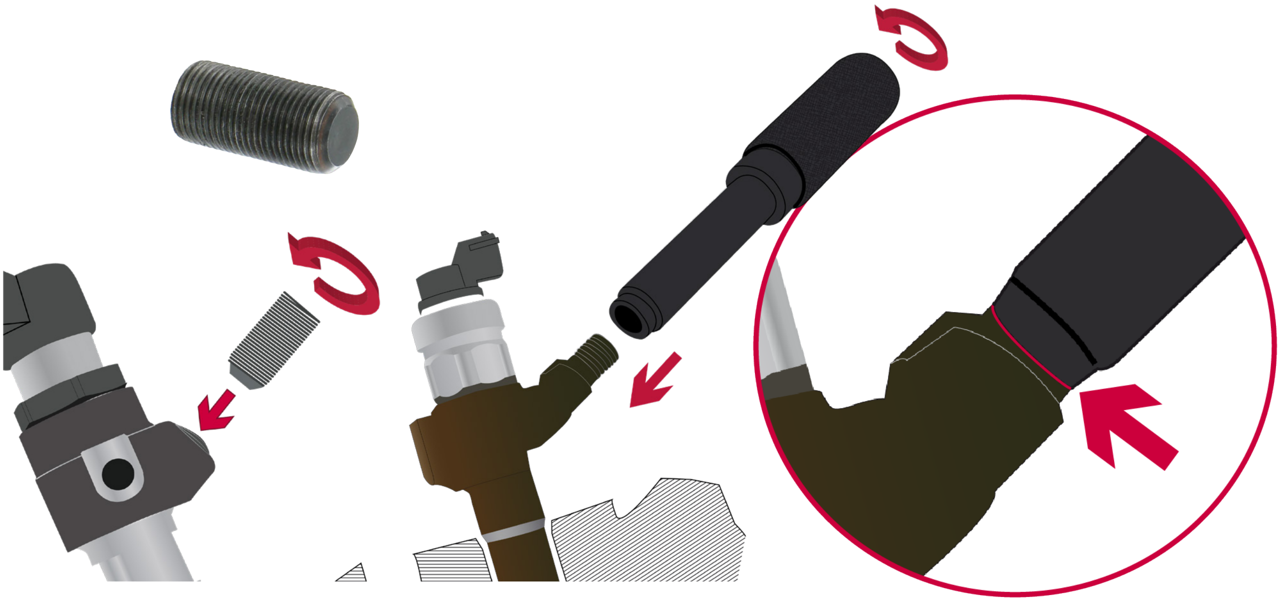
Examples of concerned engines

- Peugeot 1.6HDI DV6C
- Renault/Opel/Nissan M9R
- Mini N47
- BMW w16
- and many more…

Operations involving to remove the valve cover

- Valve cover gasket change
- Head gasket change
- Access to the camshaft
- Access to the rocker arms and pushrods
- And so on…

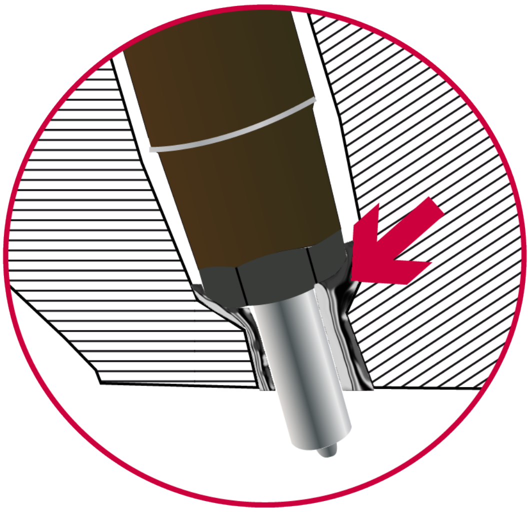
4. It never breaks during extraction thanks to heavily strong threaded coupler

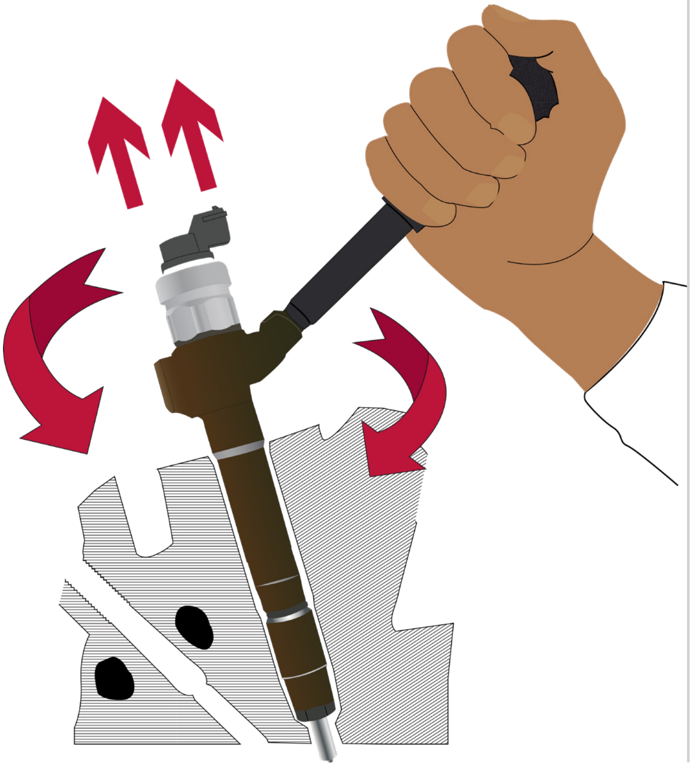


The threaded coupler allows the handle to be consolidated with the injector so no possible breaks.

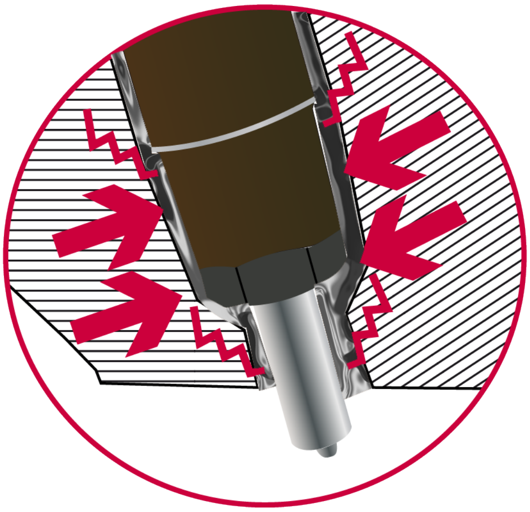
5. It extracts any stuck injectors

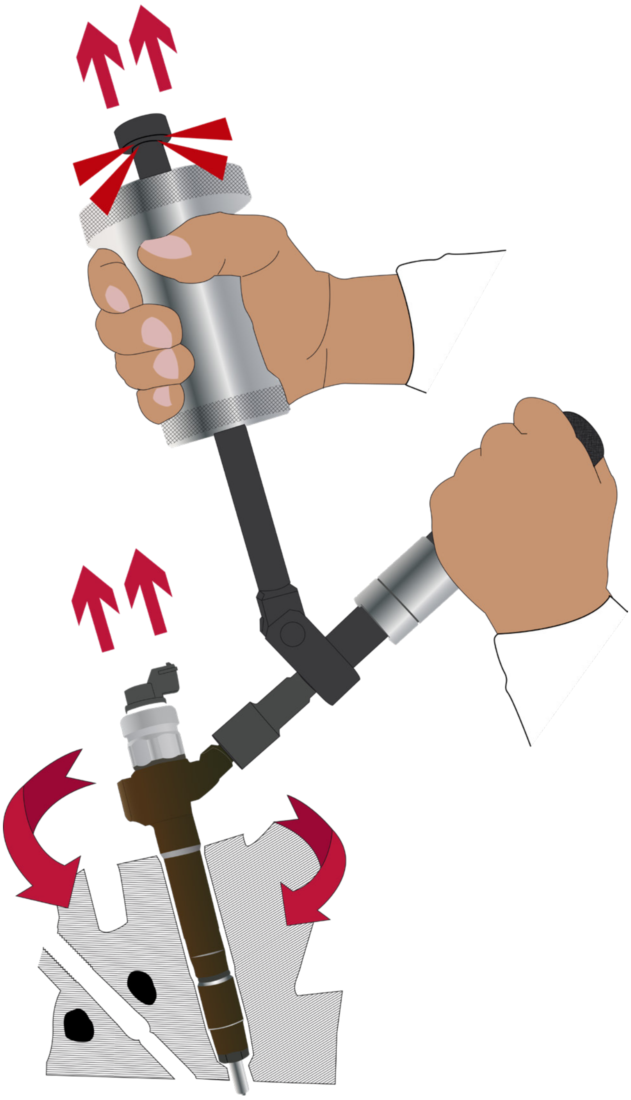
- extraction through rotation for slightly stuck injectors





- extraction through rotation with slide hammer OR/AND extraction with slide hammer for much more stuck injectors



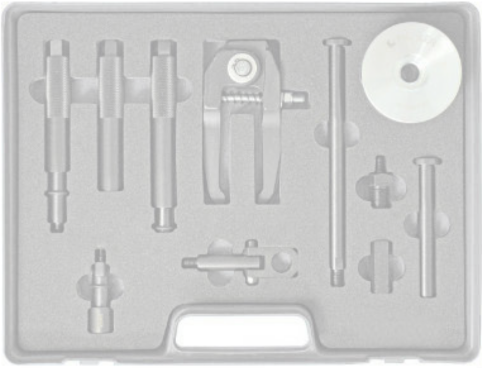


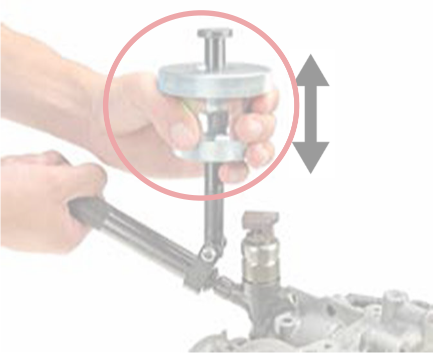
FAQ

- Is this kit universal ?

  Yes, it works on all types and brands of Common Rail and Piezo injectors like older generation Denso, Siemens Bosch and Delphi or new generation Piezzo.

- What are the advantages of this kit compared to other kits available on the market?



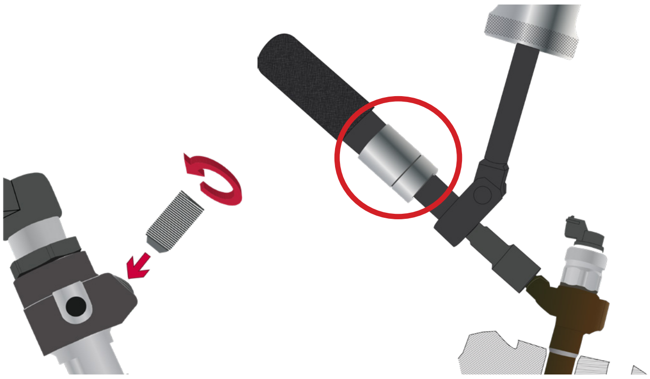


<

Hard to grip

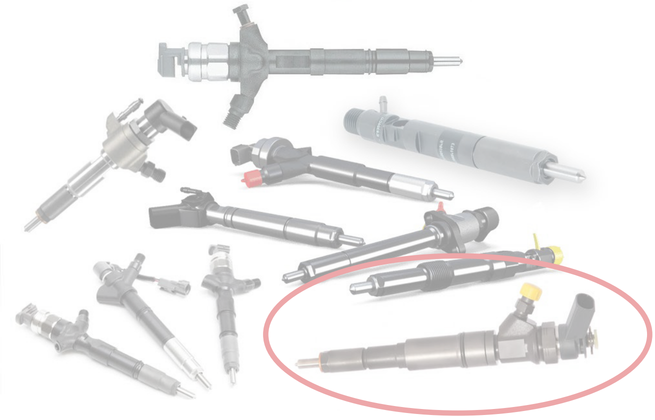
Ergonomic design fits the mechanics hand

Only 4 sizes available : not very flexible

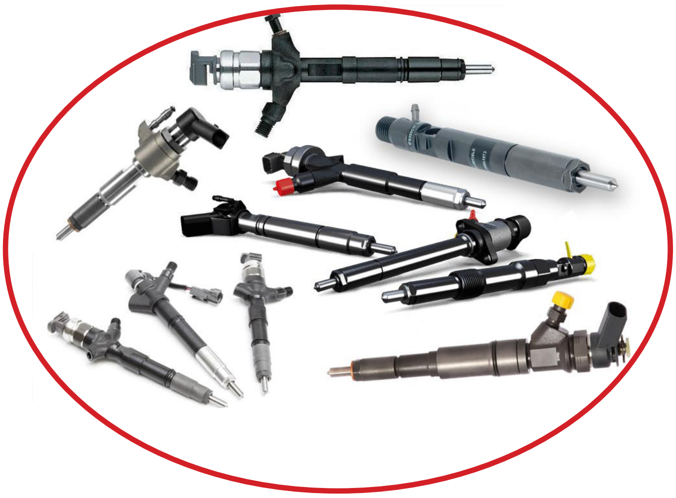


Threaded coupler and 2 spacers allow total flexibility and replace the need for several shaft sizes

On modern engines, that hook only fits on the injector in red below and tends to damage it



This kit is absolutely universal

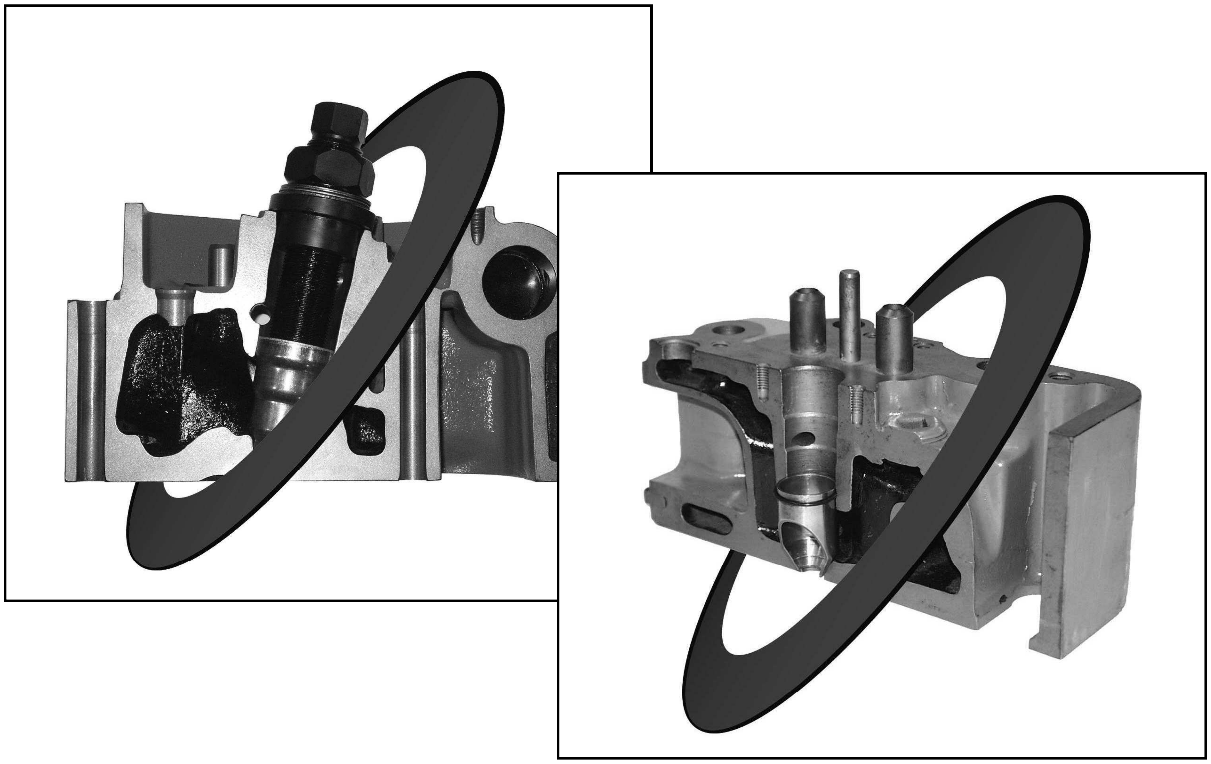


- Does this extractor work in any case?

  In 85% of cases it does the job (when the injectors are moderately stuck) but in some cases, when the injector is completely stuck, you might need a specific or hydraulic extractor.

More info?
Scan this and watch the video

Parts & Instruction Manual



Diesel Head Repair

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The Professional's Choice

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Miscellaneous Tools

Cummins Diesel Engines

The Irontite tools and processes relating to heavy duty diesel engines are related primarily to the injector sleeve areas of the respective engines. To some extent, especially with respect to the tools, the engines of a company may fit into designated categories.

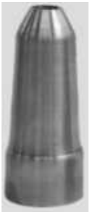
With respect to the Cummins Engines, they are grouped as follows:

220 series
C&J series
250 and L-10 series
Small V series

Which respective series can be identified by the respective configuration of the injector sleeve and the following respective engine identifying numbers:

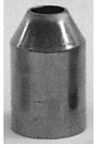
419-6192-21 – 220 series engines using this sleeve have bored of 4-7/8" and 5-1/8" and include:

NHD – 180
NH – 220
NHE – 195
NT – 743



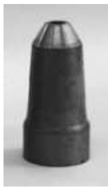
419-6192-51 – 250 and L-10/M-11 engines using this sleeve with a 5-1/2" bore include:

NH – 230
NHC – 250
NTC – 250
Super – 250
Super – 250/270
NT – 270
NT – 270
NTC – 290
NT – 310
NTC – 335
NTC – 350
N14
NTC – 400
NTA – 370
NT – 380
NTA – 400
NTA – 420
NT – 855
V – 903
V 8 – 265
V – 785
927
VT – 1710



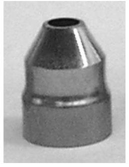
419-6192-71 – C&J series engines using this sleeve have bores of 4-1/8" and 4-7/6" and include:

JN – 130
C – 160
CR – 160
C – 180
CS – 195
JNS – 6
JNF – 130
CF – 160
C – 175
C – 190
JS – 6
JT – 6



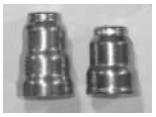
419-6192-81 – Small V series engines using this sleeve have a 4-5/8" bore and include:

V6 – 140
V8 – 185
V – 378
V – 470
V – 555
V8 – 210
V8E – 170
V – 352
V – 470
V – 504
VT – 555

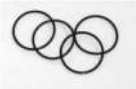


L-10/M11 series with 5-1/2" bore that use this sleeve include:

L-10 – 300
L-10 – 350
IV Formula
L-10 – 400
L-10 – BC



O-Rings



Cummins diesel engine servicing and service tools

1 – Injector sleeve removal tools
2 – Casting repair of injector seat area
3 – Injector sleeve installation and replacement
4 – Miscellaneous Cummins injector servicing tools

The Irontite injector servicing tools for use with the Cummins engines are necessarily designed to services a specific series of Cummins engines. A few of the tools are interchangeable, but in general the dimensions of the tools for servicing one specific series of engines are not right for servicing engines of a different series. Accordingly, it is important when ordering tools to identify them with the series of the engine to be serviced.

Sleeve removal tools - Cummins

The sleeve removal tools consist of two mandrels, each with tapered end, and a removal tool body with buttress threads at one end.

The mandrel is positioned up in the used sleeve with the tapered end down.

The removal tool body is brought up into the sleeve with the tapered end of the mandrel in the tool. As the mandrel is forced down, the buttressed threads on the tool expand and grab a hold on the sleeve, continue to press down on the mandrel and pull out the sleeve. The use of a press on the mandrel is recommended.

Mandrel

Tool Body

Complete Removal Tools

415-6132-20 – for 220 series engine
415-6132-50 – for 250 and L-10 engines
415-6132-70 – for C&J series engine
415-6132-80 – for small V series engine

Mandrels

415-6132-29 – for 220, 250 and L-10 engines
415-6132-59 – for C&J and small V engines

Tool bodies

415-6132-21 – for 220 series engine
415-6132-51 – for 250, L-10 and small V engines and Komatsu 155/455 engines
415-6132-71 – for C&J series engine

Injector sleeve removal tools

415-6132-20 – 220 complete tool
415-6132-50 – 250 and L-10 complete tool
415-6132-70 – C&J complete tool
415-6132-80 – small V complete tool

Extra tool bodies

415-6132-21 – for 220 series
415-6132-51 – for 250, L-10 and SmV series
415-6132-71 – for C&J series

Extra mandrels

415-6132-29 – for 220, 250 and L-10 series
415-6132-59 – for C&J and SmV series

CASTING SEAT REPAIR TOOLS - Cummins

Casting seat repair tools for rebuilding the casting injector seat

Combination Counterbore And Tapered Reamer (All Series)

414-6112-10

Tapered Tap (All Series)

407-5310-80

Tap Driver (All Series)

449-6933-30

Drill Bushing

220 Series 414-6113-10
250 Series 414-6113-12
L-10 Series 414-6113-16
C & J Series 414-6113-15
SmV Series 414-6113-18

End Facing Counterbore (All Series)

414-6113-30

Driving Arbor (All Series)

414-6114-10

Tapered Plugs (All Series)

452-2610-80

Taper Length Drill

For 220, 250 And L-10 Series: 414-6113-20
For C&J And Small V Series: 414-6113-25

Gauge Finger (All Series)

433-6991-00

Casting Seat Cutter Gauges

For 220 And 250: 414-6111-20
For L-10 Series: 414-6111-26
For C&J Series: 414-6111-25

Casting Seat Cutter

For 220, 250 And L-10 Series: 414-6114-26
For C&J And Small V Series: 414-6114-25

Counterbore Pilots For 220, 250 And L-10: 414-6113-40
Counterbore Pilots For C&J And SmV: 414-6113-45

Guide Bushings

For 220 Series : 414-6114-30
For 250 And SmV Series: 414-6114-32
For L-10 Series: 414-6114-36
For C&J Series: 414-6114-35
For SmV Series: 414-6111-28

CASTING SEAT REPAIR TOOLS – Cummins

450-6110-22 – 220 Series Kit

414-6111-20	Casting Seat Cutter Gauge w/Handle
414-6112-10	Counterbore And Tapered Reamer (Carbide)
407-5310-80	Tapered Tap
449-6933-30	Tap Driver (7/8 splt slv #3MT)
452-2610-80	Tapered Plugs (5)
414-6113-10	Drill Bushing
414-6113-20	9/16" Tapered Length Drill
414-6113-30	End Facing Counterbore
414-6113-40	Counterbore Pilot
414-6114-10	Driving Arbor
414-6114-30	Guide Bushing
414-6114-26	Seat Cutter (Carbide) – 220/250/L-10
433-6991-00	Gauge Finger
467-1611-08	1/8" HEX Key
467-1950-50	Tool Box

450-6110-25 – 250 Series Kit

414-6111-20	Casting Seat Cutter Gauge W/Handle
414-6112-10	Counterbore And Tapered Reamer (Carbide)
407-5310-80	Tapered Tap
449-6933-30	Tap Driver (7/8 splt slv #3MT)
452-2610-80	Tapered Plugs (5)
414-6113-12	Drill Bushing
414-6113-20	9/16" Tapered Length Drill
414-6113-30	End Facing Counterbore
414-6113-40	Counterbore Pilot
414-6114-10	Driving Arbor
414-6114-32	Guide Bushing
414-6114-26	Seat Cutter (Carbide) – 220/250/L-10
433-6991-00	Gauge Finger
467-1611-08	1/8" HEX Key
467-1950-50	Tool Box

450-6110-27 – C&J Series Kit

414-6111-25	Casting Seat Cutter Gauge W/Handle
414-6112-10	Counterbore And Tapered Reamer (Carbide)
407-5310-80	Tapered Tap
449-6933-30	Tap Driver (7/8 splt slv #3MT)
452-2610-80	Tapered Plugs (5)
414-6113-15	Drill Bushing
414-6113-25	½" Tapered Length Drill (C&J/SmV)
414-6113-30	End Facing Counterbore
414-6114-35	Guide Bushing
414-6114-25	Seat Cutter (Carbide)-C&J/SmV
433-6991-00	Gauge Finger
467-1611-08	1/8" HEX Key
467-1950-50	Tool Box

450-6110-26 – L-10 Series Kit

414-6111-26	Casting Seat Cutter Gauge w/ Handle
414-6112-10	Counterbore And Tapered Reamer (Carbide)
407-5310-80	Tapered Tap
449-6933-30	Tap Driver (7/8 splt slv #3MT)
452-2610-80	Tapered Plugs (5)
414-6113-16	Drill Bushing
414-6113-20	9/16" Tapered Length Drill
414-6113-30	End Facing Counterbore
414-6113-40	Counterbore Pilot
414-6114-10	Driving Arbor
414-6114-36	Guide Bushing
414-6114-26	Seat Cutter (Carbide) – 220/250/L-10
433-6991-00	Gauge Finger
467-1611-08	1/8" HEX Key
467-1950-50	Tool Box

450-6110-28 – Small V Series Kit

414-6111-28	Casting Seat Cutter Gauge W/ Handle
414-6112-10	Counterbore And Tapered Reamer (Carbide)
407-5310-80	Tapered Tap
449-6933-30	Tap Driver (7/8 splt slv #3MT)
452-2610-80	Tapered Plugs (5)
414-6113-18	Drill Bushing
414-6113-25	½" Taper Length Drill (C&J/SmV)
414-6113-30	End Facing Counterbore
414-6113-45	Counterbore Pilot
414-6114-10	Driving Arbor
414-6114-32	Guide Bushing
414-6114-25	Seat Cutter (Carbide) C&J/SmV
433-6991-00	Gauge Finger
467-1611-08	1/8" Hex Key
467-1950-50	Tool Box

CASTING SEAT REPAIR TOOLS - Cummins

450-6110-80 – Combination C&J And Small V Series Kit

414-6111-25	Casting Seat Cutter W/Gauge Handle
414-6111-28	Casting Seat Cutter Gauge W/Handle
414-6112-10	Counterbore And Tapered Reamer (Carbide)
407-5310-80	Tapered Tap
449-6933-30	Tap Driver
452-2610-80	Tapered Plugs (5)
414-6113-15	Drill Bushing
414-6113-18	Drill Bushing
414-6113-25	Taper Length Drill
414-6113-30	End Facing Counterbore
414-6113-45	Counterbore Pilot
414-6114-10	Driving Arbor
414-6114-32	Guide Bushing
414-6114-32	Guide Bushing
414-6114-25	Seat Cutter (Carbide)
433-6991-00	Gauge Finger
467-1611-08	1/8” HEX Key
467-1950-50	Tool Box

450-6110-30 – Combination 220/250 Series Kit

414-6111-20	Casting Seat Cutter Gauge W/Gauge Handle
414-6112-10	Counterbore And Tapered Reamer (Carbide)
407-5310-80	Tapered Tap
449-6933-30	Tap Driver
452-2610-80	Tapered Plugs (5)
414-6113-10	Drill Bushing
414-6113-12	Drill Bushing
414-6113-20	Taper Length Drill
414-6113-30	End Facing Counterbore
414-6113-40	Counterbore Pilot
414-6114-10	Driving Arbor
414-6114-30	Guide Bushing
414-6114-32	Guide Bushing
414-6114-26	Seat Cutter (Carbide)
433-6991-00	Gauge Finger
467-1611-08	1/8” Hex Key
467-1950-50	Tool Box

450-6110-90 – Combination Kit For All Five Series

414-6111-20	Seat Cutter Gauge W/Handle
414-6111-25	Seat Cutter Gauge W/Handle
414-6111-26	Seat Cutter Gauge W/Handle
414-6111-28	Seat Cutter Gauge W/Handle
414-6112-10	Counterbore And Tapered Reamer (Carbide)
407-5310-80	Tapered Tap
449-6933-30	Tap Driver
452-2610-80	Tapered Plugs (5)
414-6113-10	Drill Bushing
414-6113-12	Drill Bushing
414-6113-15	Drill Bushing
414-6113-16	Drill Bushing
414-6113-18	Drill Bushing
414-6113-20	Taper Length Drill
414-6113-25	Taper Length Drill
414-6113-30	End Facing Counterbore
414-6113-40	Counterbore Pilot
414-6113-45	Counterbore Pilot
414-6114-10	Driving Arbor
414-6114-30	Guide Bushing
414-6114-32	Guide Bushing
414-6114-35	Guide Bushing
414-6114-36	Guide Bushing
414-6114-25	Seat Cutter (Carbide)
414-6114-26	Seat Cutter (Carbide)
433-6991-00	Gauge Finger
467-1611-08	1/8” HEX Key
467-1950-50	Tool Box

INSTALLATION OF NEW INJECTOR SLEEVES - Cummins

Sleeve installation tools for installing new Cummins injector sleeves

416-6152-21 – Sleeve Drive-In Tools For 220 Series
416-6152-51 – Sleeve Drive-In Tools For 250 Series
416-6152-61 – Sleeve Drive-In Tools For L-10 Series
416-6152-71 – Sleeve Drive-In Tools For C&J Series
416-6152-81 – Sleeve Drive-In Tools For SmV Series

Sleeve Roll-in Tools

416-6152-23 – Regular 220 Series Sleeve Roll-In Tools
416-6152-73 – Regular C&J Series Sleeve Roll-In Tools
With Spring Tension:
416-6152-53 – Spring Tension Sleeve Roll-In Tools For 250 And L-10 Series
416-6152-83 - Spring Tension Sleeve Roll-In Tools For Small V Series

414-6114-10 – Driving Arbor (All Series)

Sleeve Seat Cutters

416-6152-27 –220, 250 And L-10 Series
416-6152-77 – For C&J Series
416-6152-87 –For SmV Series

Flat Top Protrusion Gauges

414-6111-12 – For 220 And 250 Series
414-6111-14 – For Early 903
414-6111-16 – For Late 903
414-6111-17 – For C&J Series
414-6111-19 – For L-10 Series
414-6111-18 – For SmV Series

433-6991-00 – Gauge Finger (All Series)

Guide Bushings

416-6152-26 – 220 Series
414-6114-32 – 250 And SmV Series
414-6114-36 – L-10 And C&J Series

Injector Sleeve Seat Cutter Gauges

416-6152-94 –220 And 250 Series
416-6152-95 – For Early 903
416-6152-96 – For Late 903
416-6152-97 – For C&J Series
416-6152-98 – For L-10 Series
416-6152-99 – For SmV Series

Complete Kits

450-6152-20 – Complete Kit For 220 Series
450-6152-50 – Complete Kit For 250 Series
450-6152-30 – Complete Kit For M-11 Series
450-6152-60 – Complete Kit For C&J And SmV Series
450-6152-40 – Complete Kit For L-10 Series
450-6152-70 – Complete Kit For C&J Series
450-6152-80 – Complete Kit For Smv Series
450-6152-90 – Complete Kit For All Five Series

OPTIONAL HEAD SERVICING TOOLS - Cummins

Cylinder head grooving tool

For regrooving the face of the head after it has been resurfaced, a head grooving tool with 3 sizes of pilots and extra tool fits are available.

418-6191-00 – Complete Tool
418-6191-11 – 3/8”Pilot
418-6191-12 – 7/16” Pilot
418-6191-13 – ½” Pilot
418-6191-21 – Tool Bit

In addition, as a convenience, tool bits for the ST 913 grooving tool are available: 418-6199-21

Irontite leak detector

To pressure test injector holes for leaks after new injector sleeves have been installed, Irontite has leak detectors for the several series of engine heads.

417-617220 – For 220 Series
417-617250 – For 250 And SmV Series
417-617260 – For L10 Series
417-617270 – For C&J Series

SLEEVE INSTALLATION TOOLS - Cummins

450-6152-20 – 220 series kit	
416-6152-21	Drive-In Tool
416-6152-23	Roll-In Tool
414-6114-10	Driving Arbor
416-6152-26	Guide Bushing
416-6152-27	Seat Cutter (Carbide)
416-6152-94	Seat Cutter Gauge w/Handle
433-6991-00	Gauge Finger
414-6111-12	Tip Protrusion Gauge

450-6152-70 – C&J series kit	
416-6152-71	Drive-In Tool
416-6152-73	Roll-In Tool
414-6114-10	Driving Arbor
414-6114-36	Guide Bushing
416-6152-77	Seat Cutter (Carbide)
416-6152-97	Seat Cutter Gauge w/Handle
433-6991-00	Gauge Finger
414-6111-17	Tip Protrusion Gauge

450-6152-50 – 250 series kit	
416-6152-51	Drive-In Tool
416-6152-53	Roll-In Tool w/Tension Spring
414-6114-10	Driving Arbor
414-6114-32	Guide Bushing
416-6152-27	Seat Cutter (Carbide)
416-6152-94	Seat Cutter Gauge w/Handle
433-6991-00	Gauge Finger
414-6111-12	Tip Protrusion Gauge

450-6152-80 – Small V Series Kit	
416-6152-81	Drive-In Tool
416-6152-83	Roll-In Tool w/Tension Spring
414-6114-10	Driving Arbor
414-6114-32	Guide Bushing
416-6152-87	Seat Cutter (Carbide)
416-6152-99	Seat Cutter Gauge w/Handle
433-6991-00	Gauge Finger
414-6111-18	Tip Protrusion Gauge

450-6152-40 – L10 series kit	
416-6152-61	Drive-In Tool
416-6152-53	Roll-In Tool w/Tension Spring
414-6114-10	Driving Arbor
414-6114-36	Guide Bushing
416-6152-27	Seat Cutter (Carbide)
416-6152-98	Seat Cutter Gauge w/Handle
433-6991-00	Gauge Finger
414-6111-19	Tip Protrusion Gauge

SLEEVE INSTALLATION TOOLS – Cummins

450-6152-30 – M-11 series kit	
416-6152-21	Drive-In Tool (220)
416-6152-51	Drive-In Tool (250)
416-6152-23	Roll-In Tool
416-6152-53	Roll-In Tool w/Tension Spring
414-6114-10	Driving Arbor
416-6152-26	Guide Bushing (220)
414-6114-32	Guide Bushing (250)
416-6152-27	Seat Cutter (Carbide)
416-6152-94	Seat Cutter Gauge w/Handle
433-6991-00	Gauge Finger
414-6111-12	Tip Protrusion Gauge (220/250)
414-6111-19	Tip Protrusion Gauge (L-10)

450-6152-60 – C&J/SmV series	
416-6152-71	Drive-In Tool
416-6152-81	Drive-In Tool
416-6152-73	Roll-In Tool
416-6152-83	Roll-In Tool w/Tension Spring
414-6114-10	Driving Arbor
414-6114-36	Guide Bushing (C&J)
414-6114-32	Guide Bushing (SmV)
416-6152-77	Seat Cutter (Carbide) (C&J)
416-6152-87	Seat Cutter (Carbide) (SmV)
416-6152-97	Seat Cutter Gauge w/Handle (C&J)
416-6152-99	Seat Cutter Gauge w/Handle (SmV)
433-6991-00	Gauge Finger
414-6111-17	Tip Protrusion Gauge (C&J)
414-6111-18	Tip Protrusion Gauge (SmV)

450-6152-90 – All 5 series kit	
416-6152-21	Drive-In Tool (220)
416-6152-51	Drive-In Tool (250)
416-6152-61	Drive-In Tool (L-10)
416-6152-71	Drive-In Tool (C&J)
416-6152-81	Drive-In Tool (SmV)
416-6152-23	Roll-In Tool (220 & 250)
416-6152-53	Roll-In Tool w/Tension Spring
416-6152-73	Roll-In Tool (C&J & SmV)
416-6152-83	Roll-In Tool w/Tension Spring
414-6114-10	Driving Arbor
416-6152-26	Guide Bushing (220)
414-6114-32	Guide Bushing (250 & SmV)
414-6114-36	Guide Bushing (L-10 & C&J)
416-6152-27	Seat Cutter (Carbide) (L-10)
416-6152-77	Seat Cutter (Carbide) (C&J)
416-6152-87	Seat Cutter (Carbide) (SmV)
416-6152-94	Seat Cutter Gauge w/Handle (220 & 250)
416-6152-97	Seat Cutter Gauge w/Handle (C&J)
416-6152-98	Seat Cutter Gauge w/Handle (L-10)
416-6152-99	Seat Cutter Gauge w/Handle (SmV)
433-6991-00	Gauge Finger
414-6111-12	Tip Protrusion Gauge (220 & 250)
414-6111-17	Tip Protrusion Gauge(C&J)
414-6111-18	Tip Protrusion Gauge (SmV)
414-6111-19	Tip Protrusion Gauge (L-10)

Miscellaneous Cummins head servicing tool and materials

Head Grooving Tools

418-6191-00	Complete Tools
418-6191-11	3/8” Pilot
418-6191-12	7/16” Pilot
418-6191-13	½” Pilot
418-6191-21	Tool Bit
418-6199-21	Tool Bit For Cummins St 913 Grooving Tool

Special Gauges For Cummins 903 Engine Heads

416-6152-95	Early 903 W/Handle
416-6152-96	Late 903 W/Handle

Cummins 250 Roll In Tool Tension Spring Unit

416-6153-60	Complete Tension Spring Unit

Cummins Injector Sleeves

419-6192-21	For 220 Series
419-6192-51	For 250 And L -10 Series (Std.)
419-6192-71	For C&J Series
419-6192-81	For Small V Series
419-6192-52	O-Rings For 250, L10 And Small V Series Sleeves

Cummin Leak Detectors

417-6172-20	For 220 Series
417-6172-50	For 250 And SmV Series
417-6172-60	For L-10 Series
417-6172-70	For C&J Series

Special Tools

414-6113-49	Special Pilot For Use When End Facing Off H-2 Plugs
414-6111-40	1” Parallels (Pair)
417-6152-24	Torque Wrench Adapter

KOMATSU ENGINES

TOOLS FOR REPAIRING INJECTOR SEAT AREAS OF KOMATSU ENGINE HEADS

For repairing the injector hole areas of the Komatsu 155-4 and 355-4 diesel engine heads, Irontite has available the following tools:

Flat Tip Protrusion Gauge

422-6211-15

Combination Counterbore And Tapered Reamer

414-6112-10

Tapered Tap

407-5310-80

Tap Driver

449-6933-30

Tapered Plugs

452-2610-80

Guide Bushing

421-6214-35

Gauge Finger

433-6991-00

Seat Cutter Gauge

421-6211-25

Driving Arbor

414-6114-10

10mm Taper Length Drill

421-6213-55

Casting Seat Cutter

421-6214-20

Drill Bushing

421-6213-25

End Facing Counterbore

414-6113-30

With Pilot

421-6213-40

Complete Kit: 451-6210-55

CASTING SEAT REPAIR TOOLS - Komatsu

Injector Sleeve Removal Tools For 155-4 And 355-4 Heads	
420-6232-50	Complete Tool
420-6232-59	Extra Mandrel
415-6132-51	Extra Tool Body

Casting Injector Seat Repair Tools For 155-4 And 355-4 Heads	
451-6210-55	Complete Kit
421-6211-25	Casting Seat Cutter Gauge W/Handle
414-6112-10	Combination Counterbore And Tapered Reamer (Carbide)
407-5310-80	Tapered H Tap
449-6933-30	Tap Driver
452-2610-80	Tapered H Plugs (5)
421-6213-25	Drill Bushing
421-6213-55	10MM Drill
414-6113-30	End Facing Counterbore Cutter
421-6213-40	Counterbore Pilot
421-6214-35	Guide Bushing
414-6114-10	Driving Arbor
421-6214-20	Casting Seat Cutter (Carbide)
433-6991-00	Gauge Finger
467-1611-08	1/8” HEX Key
467-1950-50	Tool Box

KOMATSU 125 ENGINE

SLEEVE REMOVAL AND INSTALLATION TOOLS

Special Tap

422-6241-10

Sleeve Remover

422-6241-20

Sleeve Drive-In Tool

422-6241-25

Special Sleeve Tip Roll-In Tool (With Thrust Drive And Tip Cage With Rollers)

422-6244-43

Standard Sleeve Roll-In Tool

422-6242-43

Sleeve Seat Cutter

422-6242-66

Sleeve Seat Cutter Gauge

422-6242-69

With Guide Bushing

422-6242-56

422-6241-00: Complete Kit

Gauge Finger

433-6991-00

INJECTOR SLEEVE REMOVAL AND INSTALLATION

Removal of old injector sleeve

1. Using the special metric tap, (422-6241-10). Thread the upper part of the inside of the old sleeve.
2. Assemble the sleeve remover, (422-6241-20), and thread the puller screw into the threads on the inside of the sleeve. Get a good grip on the sleeve.
3. Turn the puller nut against the thrust bearing and washers, and, in turn, against the puller cap, and pull out the old sleeve.

Installation of the new sleeve

1. Drive the new sleeve down into the injector hole with the sleeve drive-in tool, (422-6241-25), until the sleeve bottoms in the injector hole.
2. Using the special sleeve tip roll-in tool, (422-6244-43), roll out the end of the sleeve against the injector hole. It may be desirable to use a drill motor in rolling out this tip roll-in tool.
3. Now, using the standard sleeve roll-in tool, (422-6242-43), roll out the upper end of the sleeve.
4. Then, for a second time, using the sleeve tip roll-in tool, (624243), roll out the tip of the sleeve again.
5. Using the sleeve guide bushing and the sleeve seat cutter, (422-6242-56 and 422-6242-66), with the seat cutter gauge, (422-6242-69) and the gauge finger in place, cut the seat in the bottom of the sleeve. Cut until the dimensional pilot on the seat cutter stops the cutter at the top of the gauge.

The sleeve is now ready for use in the normal manner.

TOOLS FOR REMOVING AND INSTALLING INJECTOR SLEEVES IN KOMATSU 155-4 AND 355-4 HEADS

For removing and installing injector sleeves in Komatsu 155-4 and 355-4 diesel engine heads, Irontite has designed the following tools:

Sleeve removal tools

Tool Body

415-6132-51

Tool Mandrel

420-6232-59

Drive-In Tool

422-6252-51

Roll-In Tool

422-6252-53

Sleeve Seat Cutter

422-6252-57

Guide Bushing

422-6252-56

Seat Cutter Gauge

422-6252-95

Gauge Finger

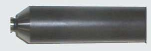
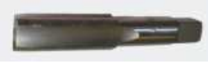
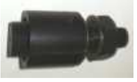
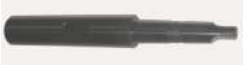
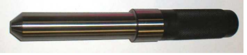
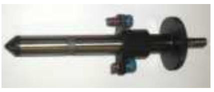
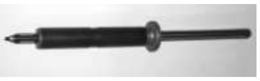
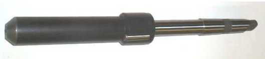
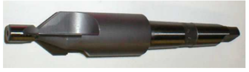
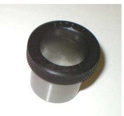
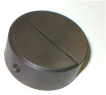
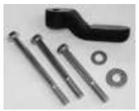
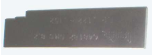
433-6991-00

Tip Protrusion Gauge

422-6211-15

420-6232-50: Complete Tool
451-6251-00: Complete Set (Including Sleeve Removal And Installation Tools)

Injector sleeve tools for Komatsu 170 engines

Injector Sleeve	1-1/4" Piloted Tap	Removal Tool w/Puller Screw, Cup And Nut	Driving Arbor
			
423-6291-70	424-6271-10	424-6271-20	414-6114-10
Sleeve Drive-In Tool	Sleeve Nose Roll-In Tool	Long Thin Roll-In Tool	Standard Roll-In Tool
			
424-6271-30	424-6271-40	424-6271-50	424-6271-60
Sleeve Seat Cutter	Guide Bushing	Cutter Gauge	Gauge Finger With Gauge
			
424-6272-27	424-6272-10	424-6272-95	433-6991-00
Tip Protrusion Gauge			
			
424-6273-11			

Injector sleeve installation instructions for Komatsu 170 engines

1. Removing the old injector sleeve
   a. Insert the pilot end of the special tap (424-6271-10) down into the sleeve and then tap the inside of the sleeve about ½" deep.
   b. Now screw the stem of the remover (424-6271-20) into the threaded sleeve and turn the nut on the remover until the sleeve remover pulls out the sleeve.
2. Installing the new injector sleeve
   a. Clean out the inside of the injector hole and replace the o-ring.
   b. Position the new injector sleeve in the injector hole and drive it down to the bottom of the casting, using the drive-in tool (424-6271-30).
   c. Now roll in the injector sleeve. Here the sleeve roll-in process involves three separate roll-in tools and four distinct steps.
   d. First, start with the nose roll-in tool (424-6271-40) with the rollers tapered to fit the tapered end of the sleeve. When using this roll-in tool, slowly turn the hand knob to give the sleeve the necessary downward thrust. Use care to not overroll the sleeve.
   e. Next, using the long thin roll-in tool (424-6271-50), roll out the short flat end of the sleeve just below the tapered part of the sleeve. Reverse the tool to roll it back out.
   f. Now go back to the nose roll-in tool (424-6271-40) and use it to smooth out the inside of the lower end of the sleeve.

   g. Use the standard roll-in tool (424-6271-60) at this point to toll out the upper portion of the sleeve. Then reverse the tool and remove it from the injector hole.
   h. It is now in order to cut the seat in the new sleeve.
3. Install the seat cutter gauge to guide the seat cutter
   a. Attach the gauge finger (433-6991-00) to the head with the smooth measuring surface directly below the injector hole.
   b. Place the gauge (424-6272-95) on the gauge finger with the thicker part of the gauge directly below the injector hole.
4. Cut the seat in the newly installed sleeve
   a. Using the guide bushing (424-6272-10), the sleeve seat cutter (424-6272-27) and the driving arbor (414-6114-10) install the sleeve cutter in the sleeve in the injector hole and cut the bottom of the sleeve until the end of the pilot on the cutter bottoms on the thicker surface of the cutter gauge.
   b. At this point the seat cutter should have cut the inside of the sleeve so that it is smooth. If the inside of the sleeve is not yet smooth, then move the thinner part of the gauge over directly under the injector hole and cut the seat a bit deeper to smooth it out. However, do not cut the seat to the point that the end of the cutter pilot is below the lower part of the gauge. To do so would protrude the ultimate injector tip too far into the injector hole. The injector tip should not protrude more than .224 beyond the surface of the head.

SLEEVE REMOVAL AND INSTALLATION TOOLS- Komatsu

Injector Sleeve Removal And Installation Tools For Komatsu 125 Engines

422-6241-00	Complete Kit
422-6241-10	Special Tap
422-6241-20	Removal Tool
422-6241-25	Drive-In Tool
422-6244-43	Special Sleeve Tip Roll-In Too
422-6242-43	Standard Sleeve Roll-In Tool
422-6242-56	Guide Bushing
422-6242-66	Sleeve Seat Cutter
422-6242-69	Seat Cutter Gauge w/Handle
433-6991-00	Gauge Finger

Injector Sleeves

423-6291-55	Injector Sleeve For 155-4 And 355-4 Engines
423-6291-70	Injector Sleeve For 170 Engines

Injector Sleeve Removal And Installation Tools For 155-4 And 355-4 Heads

451-6251-00	Complete Kit
420-6232-50	Sleeve Removal Tool
422-6252-51	Drive-In Tool
422-6252-53	Roll-In Tool
422-6252-56	Guide Bushing
422-6252-57	Seat Cutter (Carbide)
422-6252-95	Seat Cutter Gauge W/ Handle
433-6991-00	Gauge Finger
422-6211-15	Tip Protrusion Gauge

Injector sleeve for Komatsu 170 engines

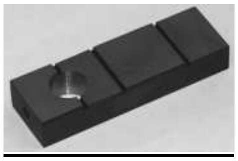
451-6271-00	Complete Kit
424-6271-10	1-1/4” Piloted Tap
424-6271-20	Sleeve Removal Tool W/Puller Screw, Cap And Nut
424-6271-30	Sleeve Drive-In Tool
424-6271-40	Sleeve Nose Roll-In Tool
424-6271-50	Long Thin Roll-In Tool
424-6271-60	Standard Roll-In Tool
424-6272-10	Guide Bushing
424-6272-27	Sleeve Seat Cutter
414-6114-10	Driving Arbor
424-6272-95	Seat Cutter Gauge W/Handle
433-6991-00	Gauge Finger
424-6273-11	Tip Protrusion Gauge
467-1950-50	Tool Box

GM – DETROIT DIESEL 53, 71 AND 92 ENGINES

INJECTOR SEAT AREA REPAIR TOOLS

The tools shown here are designed for use in rebuilding the injector seat areas of GMC 53, 71 and 92 engine heads when the injector area has developed cracks or requires rebuilding due to successive resurfacing of the face of the head or for other reasons.

Gauge



425-6411-20

Taper Length Drill

425-6413-20

Drill Bushing

425-6413-10

Combination Counterbore And Tapered Reamer

425-6412-10

End Facing Counterbore

425-6413-30

Tapered Tap

407-5307-80

Tap Driver

449-6933-30

Tapered Plugs

452-2607-80

Driving Arbor

414-6114-10

Seat Cutter

425-6414-20

Seat Cutter With Gauge Finger

433-6991-00

GMC Countersink

425-6414-50

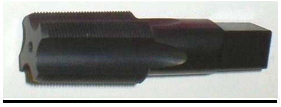
451-6410-00: Complete Kit for GMC 53, 71 & 92

CERTAIN GM – DETROIT DIESEL 71 AND 92 ENGINES

WATER DIRECTOR REPLACEMENT

For some of the 71 series engines and the early 92 series engines it is necessary to replace the larger 2-piece water director with a smaller one-piece director. For this replacement Irontite has the following tools available.

G-Oversize Tap



407-5308-40

End Facing Counterbore

425-6413-30

Installation Tool

425-6491-00

Special Size Drilled Plug (GO Short)

452-2608-55

End Facing Counterbore With Special Pilot

426-6490-95

One-Piece Water Directors

426-6491-50

CASTING REPAIR TOOLS – GM Detroit Diesel

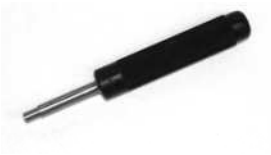
Injector Sleeve Removal Tool For 53, 71, 92 And 8.2 Series Heads	
427-6462-10	Sleeve Remover

Water Director Replacement Tools For Some 71 And 92 Series Engines	
407-5308-40	G Oversize Tapered Tap
452-2608-55	Special G Oversize Short Plug
425-6413-30	End Facing Counterbore
426-6490-95	Special Pilot For Counterbore
425-6491-00	Installation Tool
426-6491-50	Water Director

Casting Injector Seat Repair Tools For 53, 71 And 92 Series	
451-6410-00	Complete Kit
425-6411-20	Casting Seat Cutter Gauge w/Handle
425-6412-10	Combination Counterbore And Tapered Reamer (Carbide)
407-5307-80	Tapered G Tap
449-6933-30	Tap Driver
452-2607-80	Tapered G Plugs (5)
425-6413-10	Drill Bushing
425-6413-20	13/32" HSS Drill
425-6413-30	End Facing Counterbore Cutter
425-6413-40	Counterbore Pilot
414-6114-10	Driving Arbor
425-6414-30	Guide Bushing
425-6414-20	Seat Cutter (Carbide)
433-6991-00	Gauge Finger
425-6414-50	GMC Countersink
467-1611-08	1/8" HEX Key

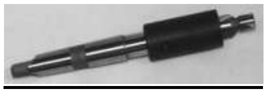
Tools for removing and installing new injector sleeves – GM Detroit Diesel 53, 71 and 92 Engine

Sleeve Removal Tool



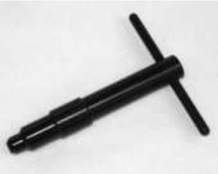
427-6462-10

Injector Hole Countersink



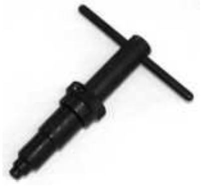
425-6414-50

Standard Sleeve Installing Tool



427-6462-50

Alternate Sleeve Installing Tool



428-6462-55

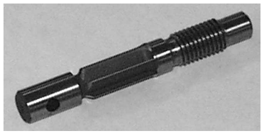
Pilot

427-6462-60

Dowel

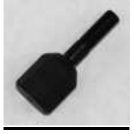
427-6462-65

Tip Reamer



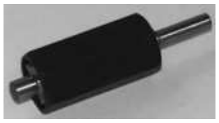
427-6463-00

Flaring Stud



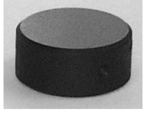
427-6463-10

End Facer



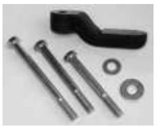
427-6464-10

Sleeve Seat Cutter Gauge



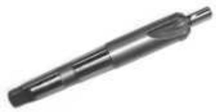
427-6464-55

Gauge Finger



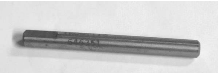
433-6991-00

Sleeve Seat Cutter



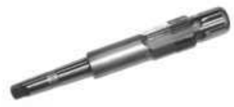
427-6464-50

Pilot



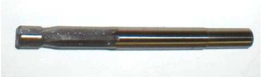
429-6463-51

Optional Sleeve Body Reamer



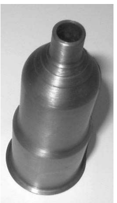
429-6463-50

Reamer



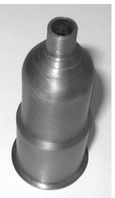
429-6463-55

Regular Injector Sleeves



430-6495-31

Thick Nose Injector Sleeves



430-6495-71

Injector Sleeve O-Ring (Buna)

430-6495-32

Injector Sleeve O-Ring (Viton)

430-6495-33

TOOLS FOR REMOVING AND INSTALLING INJECTOR SLEEVES GM – Detroit Diesel 8.2 Engines

Flat Tip Protrusion Gauge

431-6481-82

Sleeve Removal Tool

427-6462-10

Button Hook Pick

431-6482-12

Sleeve Installation Tool

431-6482-50

Sleeve Tip Expander

431-6483-10

Sleeve Tip Reamer

431-6483-00

Driver For Tip Reamer

431-6483-05

Sleeve End Facer

427-6464-10

Injector Sleeve

432-6498-35

Viton O-Ring

432-6498-33

Sleeve Seat Cutter

431-6484-50

Seat Cutter Gauge

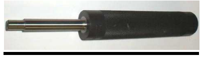
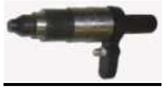
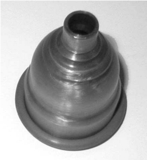
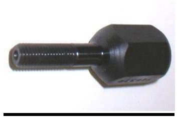
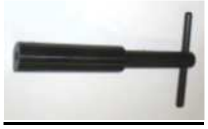
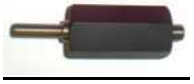
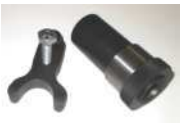
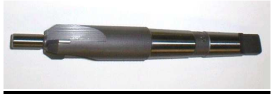
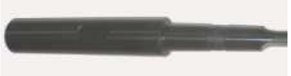
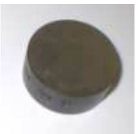
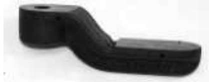
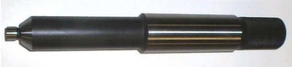
431-6484-55

Gauge Finger

433-6991-00

GMC 8.2 Complete Kit: 451-6481-00

Injector sleeve tools for GM Detroit diesel series 50 and 60 engines

Sleeve Remover	Sleeve Installation Tool	Injector Sleeve With O'ring	Flaring Stud
			
427-6462-10	433-6472-50	433-6475-31	427-6463-10
Tip Reamer	Sleeve End Facer	Guide Bushing Assembly	Seat Cutter
			
433-6474-40	427-6464-10	433-6474-30	433-6474-50
Cutter Driver	Seat Cutter Gauge	Gauge Finger	Tip Protrusion Gauge
			
414-6114-10	433-6476-55	433-6991-00	433-6474-60

451-6471-00: GMC 50/60 Complete Kit

DETROIT DIESEL 50 AND 60 ENGINES

Replacing a worn injector sleeve

1. Removing the worn injector sleeve
    a. With the sleeve remover (427-6462-10) knock the worn injector sleeve out of the injector sleeve hole and carefully clean out the injector hole before installing the new sleeve.
2. Installing the new injector sleeve in the injector hole
    a. With the o-ring in place on the sleeve, place the sleeve over the pilot (427-6462-60) onto the end of the installation tool (433-6472-50). Install the installation tool down into the injector hole and tap it to make sure that the sleeve has bottomed in the injector hole. Then lock the installation tool body clamp (458-6472-70) and the locking clamp bolt.
    b. Remove the pilot at the end of the installation tool and install the flaring stud (427-6463-10) in the end of the tool. The tip of the sleeve may be tight and it may be necessary to thread the flaring stud up through the tip of the sleeve. Continue torqueing the flaring stud up, using about 30 foot/pounds of torque, until the end of the sleeve is fully flared. Grease or anti-seize on the threads of the flaring stud may be helpful in flaring out the end of the sleeve.
    c. When the sleeve has been fully flared out, remove the flaring stud and then remove the installation tool to prepare the sleeve for cutting the seat.
3. Preparing the sleeve for cutting the seat
    a. Install the guide bushing (433-6474-30) in the injector hole and hold it in position with the guide bushing clamp (458-6474-36) locking the position clamp tightly with the locking bolt, using, if necessary, as much as 8 to 10 foot/pounds of torque on the clamp locking bolt. With the reamer driver assembly (433-6474-40 includes reamer 429-6463-55) down in the guide bushing, ream out the bottom end of the injector sleeve.
    b. Now face off the bottom end of the sleeve with the sleeve end facer (427-6464-10).
4. Cutting the seat in the new injector sleeve
    a. First install the gauge finger (433-6991-00) on the head with the smooth face of the gauge finger directly below the injector hole. Then position the seat cutter gauge (433-6476-55) on the smooth face of the gauge finger directly below the injector hole.
    b. Using the seat cutter (433-6474-50) with the driving arbor (414-6114-10) down through the guide bushing into the injector hole, cut the seat in the bottom of the sleeve until the pilot on the end of the seat cutter stops on the surface of the cutter gauge (433-6476-55). When cutting the seat run the cutter at about 200 RPM. As a further check on the depth of the seat in the sleeve, remove the seat cutter from the guide bushing and place the tip protrusion gauge (433-6474-60) down into the injector seat. The tip of the protrusion gauge should be short of the surface of the head by".000 to .008".

SLEEVE INSTALLATION TOOLS - Gm Detroit Diesel Engines

Sleeve removal and installation tools for 53, 71 and 92 series engines

451-6461-00	Complete Kit
427-6462-10	Sleeve Remover
425-6414-50	GMC Countersink
427-6462-50	STD. Sleeve Inst. Tool (With Pilot 646260 And Dowel Pin 646265)
427-6463-00	Tip Reamer
427-6463-10	Flaring Stud
427-6464-10	End Facer
427-6464-50	Sleeve Seat Cutter (Carbide)
427-6464-55	Seat Cutter Gauge W/Handle
433-6991-00	Gauge Finger
467-1611-08	1/8" HEX Key
428-6462-55	Alternate Sleeve Installation Tool With No-Stretch Adjustable Stop Nut
429-6463-50	Optional Sleeve Body Reamer (With Pilot 429-6463-51 And Tip Reamer 429-6463-55)
429-6463-55	Tip Reamer For Sleeve Body Reamer
429-6464-52	Optional Sleeve Set Seat Cutter For Thicker Sleeves (Carbide)

Injector sleeves

430-6495-31	Standard Sleeves
430-6495-71	Heavy Duty Sleeves
430-6495-32	Buna O-Rings
430-6495-33	Viton O-Rings

Sleeve removal and installation tools for 8.2 series engines

451-6481-00	Complete Kit
427-6462-10	Sleeve Remover
431-6482-12	Button-Hook Pick
431-6482-50	Sleeve Installation Tool (W/Flange And Snap Ring And Bolts)
467-1516-20	6MM Bolts (2)
431-6483-10	Tip Expander
431-6483-00	Tip Reamer
431-6483-05	Driver For Tip Reamer
467-1611-06	3/32" HEX Key
427-6464-10	End Facer
431-6484-50	Sleeve Seat Cutter (Carbide)
431-6484-55	Seat Cutter Gauge w/Handle
433-6991-00	Gauge Finger
431-6481-82	Tip Protrusion Gauge

Injector sleeves

432-6498-35	Injector Sleeve 8.2 OEM
432-6498-33	Viton O-Ring
433-6475-31	Injector Sleeve: 60 Series w/O-Ring

Sleeve removal and installation tools for 50 and 60 series engines

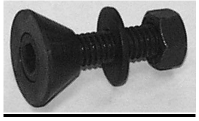
451-6471-00	Complete Kit
427-6462-10	Sleeve Removal Tool
433-6472-50	Sleeve Installation Tool Assembly w/Tool Pilot
427-6463-10	Flaring Stud
433-6474-30	Guide Bushing Assembly
433-6474-40	Tip Reamer Driver Assembly
427-6464-10	Sleeve End Facer
433-6991-00	Gauge Finger
433-6476-55	Seat Cutter Gauge W/Handle
414-6114-10	Driving Arbor
433-6474-50	Seat Cutter (Carbide)
433-6474-60	Tip Protrusion Gauge

FOR CASTING REPAIR OR RMOVAL AND INSTALLATION TOOLS NOT LISTED, CALL THE FACTORY OR SALES OFFICE FOR INFORMATION ON PARTS AND AVAILABILITY.

CATERPILLAR INJECTOR SEAT REPAIR TOOLS

CATERPILLAR 3114-3116-3126 ENGINES INJECTOR SLEEVE REMOVAL AND INSTALLATION TOOLS

Sleeve Puller Clamp



437-6551-15

Plug Tap Guide Bushing

437-6551-40

Roll-In Tool

437-6551-43

Modified Plug Tap

437-5331-36

Tip Expander Driver

437-6551-25

Sleeve Hammer Assembly

437-6995-25

Assembled Sleeve Puller

437-6552-30

Sleeve Seat Cutter

437-6553-56

Seat Cutter Guide Bushing

437-6553-66

Tip Expander

437-6551-21

CATERPILLAR 3114/3316/3126 ENGINES INJECTOR SLEEVE REMOVAL AND INSTALLATION

1. Removal of worn injector sleeve
    a. First, with the sleeve clamp (437-6551-15) tighten the worn injector sleeve tight into position, Then with the modified plug tap (437-5331-36) and the tap guide bushing (437-6551-40) thread the upper end of the worn sleeve.
    b. With the assembled sleeve puller (437-6552-30) thread the threaded puller screw (459-6552-27) into the threaded end of the sleeve. Release the sleeve clamp by unscrewing the nut at the bottom end of the clamp. Then activate the assembled sleeve puller by turning the sleeve puller nut to pull the worn sleeve out of the injector hole.
    c. Very carefully clean out the injector hole. Make sure to clean out any small rings of copper that may still be in the injector hole.

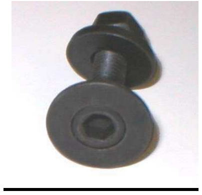
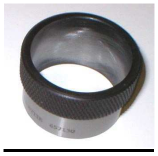
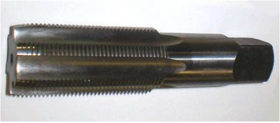
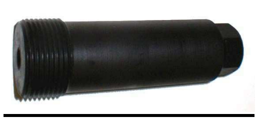
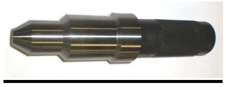
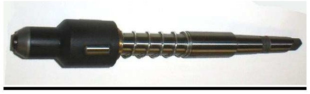
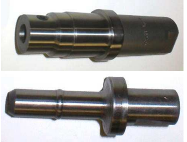
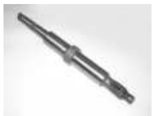
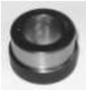
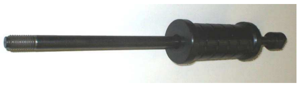
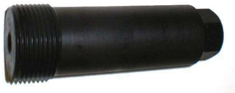
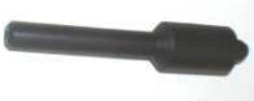
2. Installing the replacement injector sleeve
    a. First, brush the outside of the injector sleeve and the inside of the injector hole with a light coating of ceramic seal (468-9120-16).
    b. Tap the new sleeve lightly to make sure that it is down flush with the bottom of the injector hole.
    c. With the roll-in tool (437-6551-43) operating at about 50/100 RPM and the rollers covered with light oil all of the time, let the tool feed on itself all of the way to the bottom of the sleeve. This should expand the larger end of the sleeve.
    d. Now, using the slide hammer assembly (437-6995-25) with the tip expander driver (437-6551-25) and the tip expander (437-6551-21) tap the driver until the tip expander bottoms on the bottom of the new of the injector sleeve. Then withdraw the expanding unit. This

should expand the smaller end of the replacement sleeve. It may be helpful to use anti-seize compound on the expander tip.

3. Cutting the seat in the newly installed sleeve
    a. Using the sleeve seat cutter (437-6553-56) and the cutter guide bushing (437-6553-66), keeping the cutter well oiled and running at about 100 RPM, cut the injector seat no further than cleaning up the seat area or until the cutter stops on the guide bushing.

CATERPILLER DIESEL ENGINES

Tools for injector sleeve replacement in caterpillar 3176/3196 engines

Sleeve Clamp	Plug Tap Guide Bushing	Plug Tap	Threaded Sleeve Puller
			
437-6551-15	437-6571-30	437-5331-28	437-6571-80
Sleeve Drive-In Tool	Sleeve Roll-In Tool	Sleeve Flaring Tool With Stud	Sleeve Seat Cutter
			
437-6572-10	437-6571-43	437-6574-00 & 437-6574-10	437-6574-50
Guide Bushing	Sleeve Hammer Tool Assy	Threaded Sleeve Removal Tool	Sleeve Removal Tool
			
437-6574-20	437-6995-25	437-6571-80	437-6571-50

Complete Kit: 434-6571-00

Caterpillar 3176-3196 injector sleeve servicing

1. Removing the worn injector sleeve
    a. First lock the worn injector sleeve in tight, using the sleeve clamp (437-6551-15), so that the sleeve will not turn. Using the 1-7/16-12 plug tap (437-5331-28), supported by the tap guide bushing (437-6571-30), thread the upper end ½" or so of the inside of the sleeve.
    b. Remove the sleeve clamp and install the sleeve remover mandrel (437-6571-50) into the sleeve from the top side of the head. Now screw the threaded remover (437-6571-80) into the sleeve. A hydraulic press is needed to press the mandrel and remove the sleeve.
    c. With the wire brush, clean out the injector hole, be sure to clean the copper bits out of all the grooves in the seat.
2. Installing the replacement sleeve
    a. Brush the cleaned-out injector seat area with the Irontite ceramic seal and then insert the replacement injector sleeve down into the injector hole.

   b. Using the sleeve drive-in tool (437-6572-10), drive in the sleeve in until it bottoms on the injector hole.
   c. With the new sleeve in place, roll out the upper portion of the sleeve with the sleeve roll-in tool (437-6571-43). For the roll out process use a seat and guide machine operating at about 50/110 RPM and keep the rollers covered with a light oil at all times. In the process let the roll-in tool feed on itself all the way to the bottom of the sleeve. Then reverse the tool and remove it from the injector hole.
   d. Now attach the sleeve flaring tool (437-6574-00), with the sleeve tip expander (437-6574-10), to the end of the slide hammer shaft (699510), with the slide hammer weight (459-6995-30), drive the sleeve flaring tool until the sleeve tip expander bottoms on the injector area. Then withdraw the sleeve flaring tool.

3. Cutting the seat in replacement sleeve
   a. Using the sleeve seat cutter (437-6574-50) and the cutter guide bushing (437-6574-20) keeping the cutter well oiled and running at about 100 ROM, cut the injector seat no further than cleaning up the seat area or until the cutter stops on the guide bushing.

CATERPILLAR INJECTOR SLEEVE SERVICING

Medium Duty Diesel Engine Caterpillar 3114-3116-3126 Sleeve Removal And Installation Tools	
451-6551-00	Complete Kit
643-7551-15	Sleeve Clamp
437-5331-36	Plug Tap 1-3/16”-12
437-6551-40	Plug Tap Guide Bushing
437-6552-30	Sleeve Puller
437-6995-25	Sleeve Hammer Tool Assembly (Incl. Slide Hammer Shaft 459-6995-10, Slide Hammer Stop 459-6995-20, And Slide Hammer Weight 459-6995-30)
437-6551-21	Tip Expander
437-6551-25	Tip Expander Driver
437-6551-43	Sleeve Roll-In Tool
437-6553-56	Sleeve Seat Cutter
437-6553-66	Seat Cutter Guide Bushing

Caterpillar 3176/3196 Sleeve Removal And Installation Tools	
434-6571-00	Complete Kit
437-6551-15	Sleeve Clamp
437-5331-28	Plug Tap 1-7/16”-12
437-6571-30	Plug Tap Guide Bushing
437-6571-80	Threaded Sleeve Puller
437-6995-25	Sleeve Hammer Tool Assembly (Incl. Slide Hammer Shaft 459-6995-10, Slide Hammer Stop 459-6995-20, And Slide Hammer Weight 459-6995-30)
437-6571-50	Sleeve Puller Mandrel
437-6572-10	Sleeve Drive-In Tool
437-6574-10	Sleeve Tip Expander
437-6574-00	Sleeve Tip Expander Driver
437-6571-43	Sleeve Roll-In Tool
437-6574-50	Sleeve Seat Cutter
437-6574-20	Sl. Seat Cutter Guide Bushing

MACK 2-VALVE DIESEL ENGINES

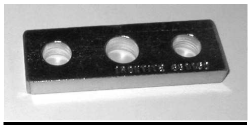
Area of Mack 2-valve engines, including #465, 673, 675, 711, 864 and #865

Head Leveling Tools

Leveling Guide Bushing

441-6611-35

Hold Down Clamp



438-6611-50

Leveling Pilot

438-6611-42 – 3/8”
438-6611-43 - .385
438-6611-44 – 13/32”
438-6611-45 – 7/16”

Alternate Piloted Drills To Counterbore Area Hole

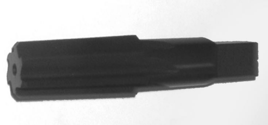
Straight Shank

438-6612-55

Morse Taper Shank

438-6612-65

Tapered “G” Reamer



407-5207-80

Tapered “G” Tap

407-5307-80

Tap Driver

449-6933-30

Tapered “G” Plug

452-2607-80

Drill Bushing

438-6613-12

Letter “W” Drill

438-6613-20

End Facing Counterbore With Pilot

438-6613-30

Counterbore Stop Collar

439-6613-50

Optional Positioning Legs	Intake Side	Exhaust Side
#465	440-6611-14	440-6611-15
#673, 675 and 711	440-6611-16	440-6611-17
#865	440-6611-18	440-6611-19
#864	440-6611-20	440-6611-21

661000 – Complete Kit

MACK 2-VALVE ENGINE INJECTOR SLEEVE REMOVAL AND INSTALLATION TOOLS

7/8-14 Plug Tap	Sleeve Removal Tool	Sleeve Drive-In Tool
443-6664-14	443-6664-30	443-6662-10

MACK GROOVING TOOL

Irontite has developed an easy to use head grooving tool for cutting grooves in mack heads after they have been resurfaced.

444-6691-00	Complete Tool	With 1 Tool Bit: 445-6697-26
444-6697-25	For Series	E9-EM 998 And EM 400 And E7 4-Valve Heads
445-6697-26	For Series	E6 – EM 998 And EM 350, 673, 675 And 676
445-6697-27	For Series	E7-250/425 Hp
445-6697-28	For Series	865 & 866 – 8 Cylinder 2-Valve

ENGINE CASTING REPAIR TOOLS – Mack Diesel

Injector Seat Area Casting Repair Tools For 2-Valve Engines Listed Below:

451-6610-00	Complete Kit
441-6611-35	Leveling Guide Bushing
438-6611-50	Hold Down Clamp
438-6611-42	3/8” Leveling Pilot
438-6611-43	.385 Leveling Pilot
438-6611-44	13/32” Leveling Pilot
438-6611-45	7/16” Leveling Pilot
438-6612-55	Straight Shank Piloted Drill
OR	
438-6612-65	Morse Taper Piloted Drill
407-5207-80	Tapered G Reamer
407-5307-80	Tapered G Tap
452-2607-80	Tapered G Plugs (5)
449-6933-30	Tap Driver
438-6613-12	Drill Bushing
438-6613-20	“W” Taper Length Drill
438-6613-30	13/16” Straight Shank Counterbore (With Built-In Pilot)
439-6613-50	Stop Collar
467-1611-08	1/8” HEX Wrench

Optional Legs For Positioning The Injector Hole In Vertical Position

440-6611-14	For #465 Heads (IN)
440-6611-15	For #465 Heads (EX)
440-6611-16	For 673, 675 And 711 Heads (IN)
440-6611-17	For 673, 675 And 711 Heads (EX)
440-6611-18	For 865 Heads (IN)
440-6611-19	For 865 Heads (EX)
440-6611-20	For 864 Heads (IN)
440-6611-21	For 864 Heads (EX)

Mack 2-Valve Engine Injector Sleeve Removal And Installation Tools

451-6663-00	Complete Kit
443-6664-14	7/8-14 Plug Tap
443-6664-30	Sleeve Removal Tool
443-6662-10	Sleeve Drive-In Tool

Mack Head Grooving Tool

444-6691-00	Complete Tool (Including Tool Bit 669726)

Tool Bits For Grooving Tool

444-6697-25	For Series E9-EM 400 And EM998 – 8 Cyl. 4 Valve
445-6697-26	For 673, 675 And 676 – 6 Cyl. 2 Valve And Series E6-EM 300 And EM 350- 6cyl 4 Valve
445-6697-27	For Series E7-250-425 HP 6 Cyl. 4 Valve
445-6697-28	For 865 And 866 – 8cyl. 2 Valve

FOR CASTING REPAIR OR REMOVAL AND INSTALLATION TOOLS NOT LISTED, CALL THE FACTORY OR SALES OFFICES FOR INFORMATION ON PARTS AND AVAILABILITY.

NAVISTAR-INTERNATIONAL 239/259 ENGINES

Navistar-international 239/259 injector sleeve removal and installing tools

Removal Tool

447-6724-30

Sleeve Drive-In Tool

447-6722-10

Sleeve Roll In Tool

447-6722-43

Injector Sleeve

448-6792-39

Complete Kit: 451-6723-00 Includes Removal Tool, Drive In Tool and Roll In Tool

239/259 Injector Sleeve Tools	
451-6723-00	Complete Kit Includes: Removal Tool, Drive-In Tool And Roll-In Tool
447-6724-30	Removal Tool
447-6722-10	Sleeve Drive-In Tool
447-6722-43	Sleeve Roll-In Tool

Injector Sleeves	
448-6792-39	For 239 And 259 Engines

NAVISTAR-INTERNATIONAL 466 ENGINES

Navistar-International 466 Injector Sleeve Removal And Installation Tools

Removal Tool

448-6744-30

Drive In Tool

448-6742-10

Roll In Tool

448-6742-43

Injector Sleeve

448-6794-61

Complete Kit: 451-6743-00 Includes Removal Tool, Drive In Tool and Roll In Tool

466 Injector Sleeve Tools	
451-6743-00	Complete Kit Includes: Removal Tool, Drive-In Tool And Roll-In Tool
448-6744-30	Removal Tool
448-6742-10	Drive-In Tool
448-6742-43	Roll-In Tool

Injector Sleeves	
448-6794-61	For 466 And 360 Heads (Also Fits 414 And 436)

SPECIAL NOTE about the use of 466 sleeve removal and installation tools: The Navistar-international 466 sleeve removal and installation tools work equally well with the 466 and the 360, 414 and 436 Navistar-International engines.

NAVISTAR-INTERNATIONAL 7.3 POWER STROKER, 466E and 530E ENGINES

Navistar-International 7.3 Power-Stroker Injector Sleeve Removal And Installation Tools

Removal Tool

448-6774-30

Installation Tool

448-6772-10

Sleeves

448-6797-31

Complete Kit: 451- 6773-00 Includes Removal Tool, Drive-In Tool and Roll-In Tool

466 Injector Sleeve Tools	
451-6773-00	Complete Kit Includes: Removal Tool, Drive-In Tool And Roll-In Tool
448-6774-30	Removal Tool
448-6772-10	Drive-In Tool

Injector Sleeves	
448-6797-31	For 7.3 Power Stroker Heads

MISCELLANEOUS DIESEL TOOLS

Split sleeve tap drivers	Tap size	O.D.M.T.
449-6933-20	¾"	#3
449-6933-30	7/8"	#3
449-6933-35	7/8"	#4
449-6933-50	1"	#4

Extension adapter sleeve	Inside M T	Outside MT	Length
449-6935-20	#2	#3	4-1/2"
449-6935-25	#2	#4	5"
449-6935-30	#3	#4	5-1/2"
449-6935-50	#4	#3	9-1/2"

I D L adapters	Inside M T	Outside Dia.
449-6935-70	#2	IDL
449-6935-75	#3	IDL

Bridgeport and D C M adapters	Inside MT	Outside Dia.
449-6935-90	#2	7/8"
449-6935-98	7/8"	R8 COLLET

Crossover guide pins		
		Dia. @ Large End
449-6937-35	For Cummins 335-350	.563
449-6937-50	For Cummins 220-250	.625
449-6937-66	For caterpillar 3406	.567

Split sleeve tap drivers		
	Tap Size	O.D. M.T. of driver
449-6933-20	¾"	#3
449-6933-30	7/8"	#3
449-6933-35	7/8"	#4
449-6933-50	1"	#4

Adapter Sleeves

	M T inside	M T outside	Length
449-693520	#2	#3	4-1/2”
449-693525	#2	#4	5”
449-693530	#3	#4	5-1/2”
449-693550	#4	#3	9-1/2”

I D L Adapters

449-693570	#2 M T Inside I D L Outside
449-693575	#3 M T Inside I D L Outside

D C M Adapters

449-693590	Adapter
449-693598	R8 7/8” Round Collet

Crossover Guide Pins

		DIA. @ Large End
449-693735	For Cummins 335-350	.563
449-693750	For Cummins 220-250	.625
449-693766	For Caterpillar 3406	.567

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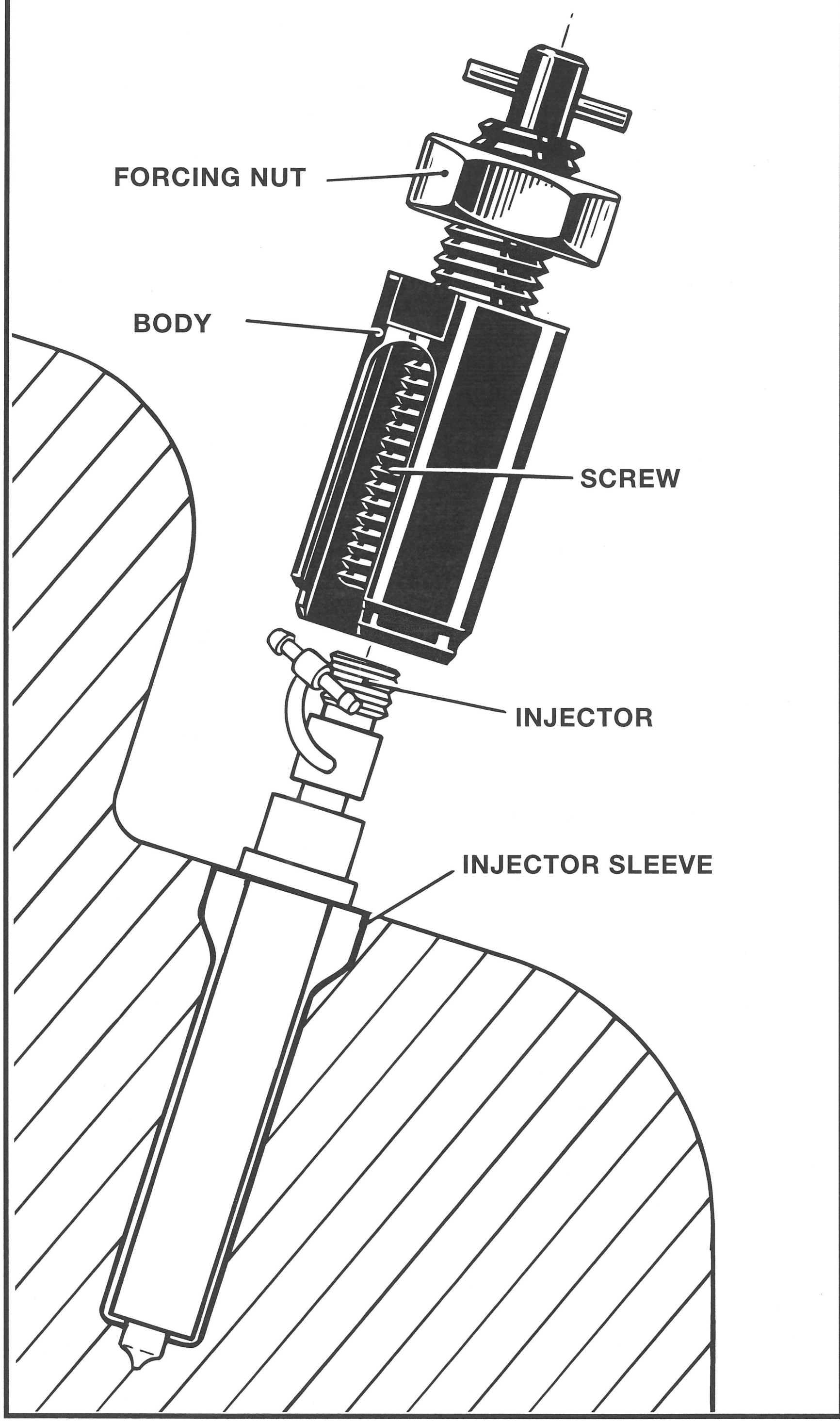
KIENE
DIESEL ACCESSORIES, INC.

S-1100
Injector Puller
Navistar Engines

S-1100 INJECTOR PULLER



FEATURES

APPLICATIONS:

THE S-1100 INJECTOR PULLER WILL PULL INJECTORS FROM NAVISTAR 300 AND 400 SERIES ENGINES, INCLUDING:

DT & DTA 466

DT & DTA 360

This tool's compact design saves time and money by removing injectors from all cylinders including the tight **in-chassis** applications.

The unique design of the S-1100 Puller saves more time by preventing accidental removal of the injector sleeve. This means that draining of coolant and replacement of sleeves is eliminated. **No other puller works this way.**

Simple rugged design is easy to use and will provide years of service.

INSTRUCTIONS

1. Remove fuel line from injector and push to side.
2. Slide S-1100 Puller down over injector with slot in body fitting over leak-off fitting on injector.
3. Fit base of body into top of injector sleeve. Make certain it is seated on the sleeve, not the cylinder head surface.
4. Thread screw onto injector fuel fitting - finger tight only.
5. Tighten forcing nut to pull injector from engine.

Proudly
Made in USA

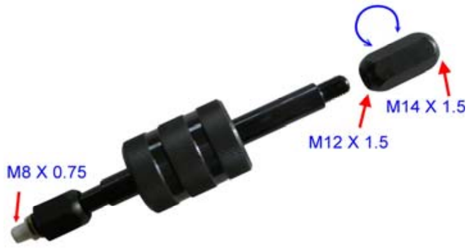
KIENE Equipment...
an investment in safety
and productivity

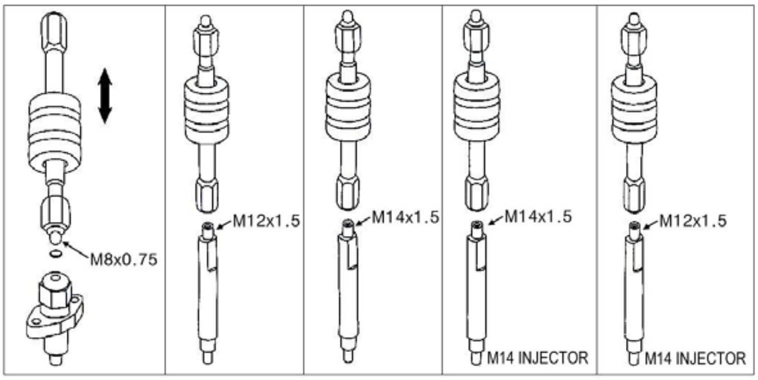
KIENE
DIESEL ACCESSORIES, INC.
325 S. Fairbank Street, Addison, IL 60101
Phone: 1-800-264-5950 • 630-543-5950 • Fax: 630-543-5953
www.kienediesel.com • Email: info@kienediesel.com

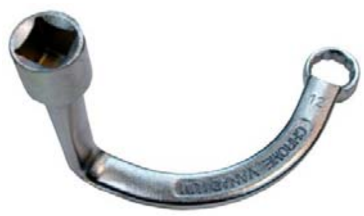
KA-2877N Diesel Injector puller

Assists removal of stubborn bosch and lucas diesel injectors – saves time and money when injectors are difficult to remove.

- With M8 - M12 - M14 adapters
- L:230mm







KA-3633 Special Wrench for Turbo

The Special Wrench For Turbo

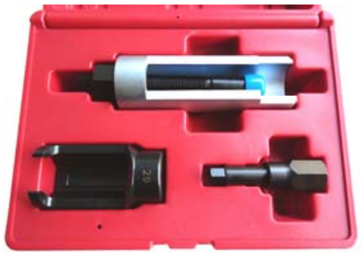
Special wrench for screwing on the turbo-charger in diesel engines of VW / AUDI; new model, short type, from now on very convenient assembling and disassembling for screw underneath the turbo-charger.

- For:VW / AUDI
- Drive: 3/8" □
- Size：12 mm x 12PT

25mm
27mm
29mm
30mm

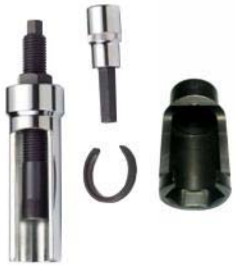
KA-5171 Diesel Injector Nozzle Socket

- 1/2” DR. socket can use for SIEMENS & BOSCH
- Size: 25, 27, 29 , 30mm
- Suitable for Peugeot and Citroen with 2.0 engines (110/135HP) HDI engine.



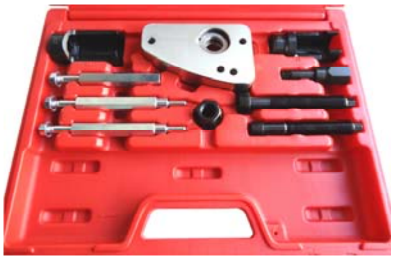
KA-2054 3pcs Diesel Injector Puller Set

- This special designed diesel injector puller set is ideally for the need to remove stubborn diesel injector. No need to remove cam cover and the use of slide hammer.
- Fitted mainly to Mercedes C-class, E-class, Sprinter Vehicles and Chrysler Grand Cherokee 27crd(00-)



KA-2054A 4pcs Injector Nozzle Puller Set

- Screw off the nozzle head, Screw in the puller spindle, Insert the support ring, Push the support sleeve over the spindle and screw on the collar nut then pull out the nozzle by turning the collar nut.
- Support sleeve, Pull spindle, Shoulder nut M16×1.5, Support ring, Special bit insert 10 mm hex, Axial bearing, Circlip, Special socket insert 29mm hex
- For Mercedes CDI Motore OM 611,612,613



KA-2056 Diesel Injector Nozzle Extractor Set

Suitable for PSA 2,0 (110, 135 HP) HDI engines e.g. Peugeot, Citroën etc. (engine code DW 10)

- Identify injector "blow-by" exists (The leaking of combustion gases from the cylinder through the injector seat, the “blow-by” causes starting symptoms and poor running, excessive smoke, tar build-up, loss and noise of compression).
- Re-face the diesel injector seat in order for the new or reconditioned injector to be fitted correctly.
- Clean and re-cutting of injector seat.
- Avoid a high risk of “blow-by” occurring cause of the build up of carbon deposits and the effects of corrosion.
- Application for all modern common rail diesel engines.
- Don’t use with air tools

KA-3636A 5pcs Diesel Injector Seat Cutter Set

Material: CRMO

Kit contents:

- 15mm Flat Reamer for Universal injector.
- 17mm Flat Reamer for Delphi/Bosch injectors (BMW/PSA/Renault/Ford).
- 19mm Flat Reamer for Bosch injectors (Mercedes CRD).
- 19mm Angled Reamer for Fiat/Iveco.
- Pilot post x 1pc

KA-3636AE 6pcs Diesel Injector Seat Cutter Set

Material: CRMO

Kit contents:

- 15mm Flat Reamer for Universal injector.
- 17mm Flat Reamer for Delphi/Bosch injectors (BMW/PSA/Renault/Ford).
- 17mm Angled Reamer for Mercedes Benz CDI
- 19mm Flat Reamer for Bosch injectors (Mercedes CRD).
- 19mm Angled Reamer for Fiat/Iveco.
- Pilot post x 1pc

KA-3636B 6pcs Diesel Injector Seat Cutter Set

Material: CRMO

Kit contents:

- 15mm Flat Reamer for Universal injector.
- 17mm Flat Reamer for Delphi/Bosch injectors (BMW/PSA/Renault/Ford).
- 19mm Flat Reamer for Bosch injectors (Mercedes CRD).
- 19mm Angled Reamer for Fiat/Iveco.
- T handle x 1pc
- Pilot post x 1pc

KA-3636C EVA Tray

KA-3636E 7pcs Diesel Injector Seat Cutter Set

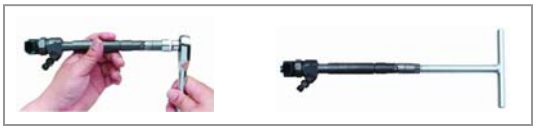
Material: CRMO

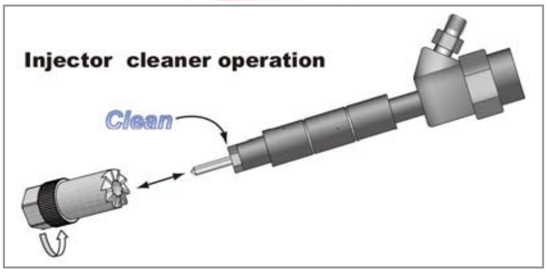
Kit contents:

- 15mm Flat Reamer for Universal injector.
- 17mm Flat Reamer for Delphi/Bosch injectors (BMW/PSA/Renault/Ford).
- 17mm Angled Reamer for Mercedes Benz CDI
- 19mm Flat Reamer for Bosch injectors (Mercedes CRD).
- 21mm Angled Reamer for Fiat/Iveco.
- T handle x 1pc
- Pilot post x 1pc

KA-3636D 8pcs Diesel Injector Seat Cutter Set

- Used for cleaning place under injection washer after replacing injector.
- It is necessary to clean place under and above washer for perfect fit new or replaced diesel injector.





KA-3636G 8pcs Diesel Injector Seat Cutter Set

Carbon Residue tends to accumulate on the injector seat and injector nozzle Regular diesel injector seat cutter seat only cleans and cut the injector seat, but KA-3636G not only clean the seat but also the nozzles

- A complete kit to service seat & injector nozzle
- Clean the injector nozzles
- Clean and re-cut the injector seat
- Re-face the diesel injector seat to fit the new or reconditioned injector correctly.
- Application for all modern common rail diesel engines.
- Don’t use with air tools
- Material: CRMO

Kit contents:

- 15mm Flat Reamer for Universal injector.
- 17mm Flat Reamer for Delphi/Bosch injectors (BMW/PSA/Renault/Ford).
- 17mm Angled Reamer for Mercedes Benz CDI
- 19mm Flat Reamer for Bosch injectors (Mercedes CRD).
- 21mm Angled Reamer for Fiat/Iveco.
- Injector Cleaner (58-60 degree)
- T handle x 1pc
- Pilot post x 1pc

KA-3636H

KA-3636J

Diesel Injector / Injector Seat Cleaner Set

Used to clean injector / injector seat when changing injector.
Helps to avoid blow-back due to poorly sested injector.
Suitable for a wide range of vehicles.

Contents:	KA-3636H	KA-3636J
15mm*19mm Flat Reamer, for various vehicles	●	●
17mm*17mm Angled Reamer, for Fiat, Iveco, Ford, Mercedes CDI	●	●
17mm*17mm Flat Reamer, for Bosch / Delphi (BMW, Ford, PSA, Renault)	●	●
17mm*19mm Flat Reamer, for Bosch (Mercedes CRD)	●	●
17mm*21mm Angled Reamer, for Fiat, Iveco	●	●
18mm*21mm Flat Reamer, for various vehicles	●	●
20mm*21mm Flat Reamer, for various vehicles	●	●
15.5 mm*225mm Cutter, for Bosch	●	●
Pilot Hes 19mm*170mm	●	●
T handle 135*160mm 19 socket	●	●
2.5mm Hex Key	●	●
Cleaner 19mm, for injector cleaner	●	--

KA-3636F 9pcs Diesel Injector Seat Cutter Set

- Specially designed for clean and re-cutting of injector seats on modern common rail diesel engines.
- The kit includes 5 seat cutting reamers for Bosch, Delphi and universal application along with a special angled reamer for Iveco/Fiat applications.
- Include 3 sizes of reamer chuck for 17, 19 and 21mm is suitable cleaning for injector nozzle end.

KA-3696 Injector Seat Cleaning Set

- Suitable for 2.0 TDI engine from VAG group.
- To clean the contact surface between the injector and engine head when making the replacement.
- Include cutter holder can made cutter is straight and correct to attach when do cleaning.
- Insert the extension bar in to the cutter for deep hole cleaning.

KA-3642 Copper Washer Removal Tool For Diesel Injector

- Size: inner hole 7
- Length: 230mm
- Collet type easy to holding the copper washer.

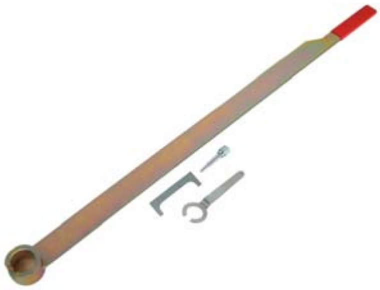
KA-8377 Diesel Injector Remover

- This specialist kit is designed primarily for removing seized diesel injectors from VAG TDI engines
- The set includes a 0.5kg slide hammer with threaded adaptors in direct, offset and hook profiles.
- Model: VAG-TDI

KA-8377A

KA-4027 4pc Diesel Injector Removal Set-Delphi & Bosch

Specifically designed for removing Delphi/Bosch diesel injectors using a Slide Hammer with 5/8" UNF thread.
Adaptors can also be used with an air tool to loosen the injectors by vibration.
Set of 3 adaptors plus a special tool for removing the internal part of Bosch injectors.



KA-8374 Diesel Engine Setting/Locking Tool Set

- VW GROUP 2.5TDI common rail diesel engines (Belt) in
  VOLKSWAGEN LT Crafter
  BJJ, BJK, BJL and BJM engines
- Contents:
  Crankshaft pulley holding tool
  Crankshaft locking pin
  Camshaft setting plate
  Tensioner adjuster

KA-4028 Puller for Sealing Ring

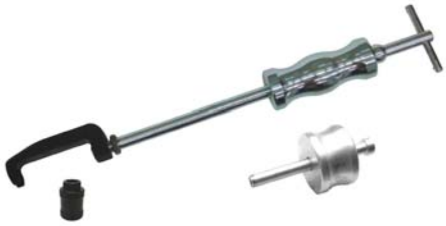
For use on sealing rings with internal diameter 4 - 16 mm, e.g. injector nozzle sealing rings on Mercedes CDI engines.
The puller extracts the sealing rings correctly, for example from between the injector nozzle and the cylinder head.
To pull out the sealing ring, screw the taper point of the tool into it, then remove with the impact-type puller.

KA-3639 Injector Puller Set

Mercedes CDi
This six piece puller set has been especially designed for removing stubbon injectors on Mercedes Benz vehicles fitted with CDi engines.
Packed in a blow moulded case.

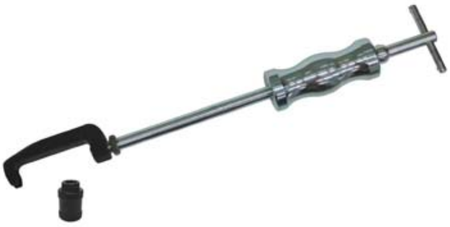
Injector Extractor

- With this tool, when removing seized or stuck Common Rail injectors, no more need to disassemble the cylinder head.
- Applicable for MERCEDES-BENZ CDI engines 611, 612, 613, etc.
- Especially for the limited spaces due to the cylinder head cover



KA-3968

Contents:
1 Impact Extractor
1 Injector Claw
1 External Adapter
1 Slide Hammer



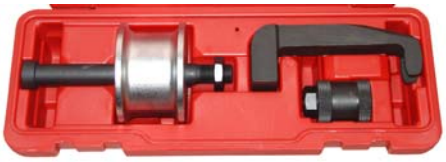
KA-3970

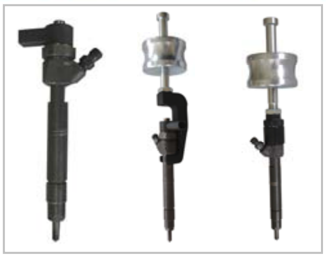
Contents:
1 Impact Extractor
1 Injector Claw
1 External Adapter

Injector Puller For Mercedes-Benz (slide hammer style)

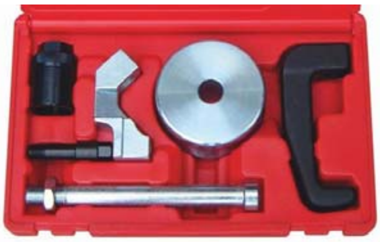
- For removing adapted tight common rail injectors without having to disassemble cylinder head.
- Use for Mercedes-Benz CD engines 611.612.613...etc.
- Injection puller with impact hammer, injection nozzles that do not fit very tightly can be pulled out without needing to take them apart or remove the cylinder block.

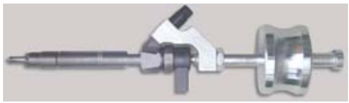
KA-3969 4PCS



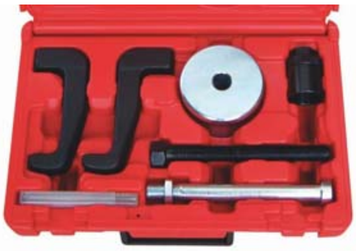


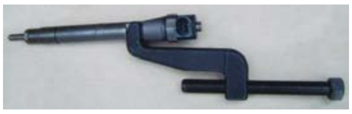
KA-5167B 6PCS

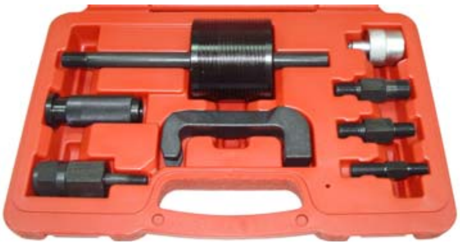


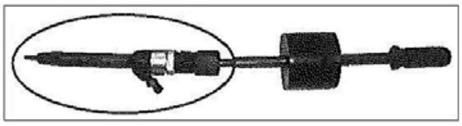


KA-5167C 7PCS









This high quality tooling is designed for the removal of stuck and seized injectors.

KA-5167A 9pcs Common Rail Injectors Extractor Set

Feature:

- With slide hammer for DB CDI-engines & Mercedes CDI engines OM 611, 612, 613 etc.
- For removing stuck and the seized common-rail injectors without dismount the cylinder head.
- The sturdy construction will enable the swift removal of even the most severly seized in injector.

Specification:

- Material: S45C steel
- Total Length: 350mmL
- Contents: Slide Hammer (1.75kgs)
  Adaptor M17 x 1.0
  Adaptor M27 x 1.0 for Bosch injector nozzle.
  Adaptor: Puller w/M12 x 1.75

KA-4032 Injector Nozzle Tool Set

- Mercedes CDI engines (German Utility Model)
- Suitable for Mercedes CDI engines OM 611, 612, 613, etc.
- This injector nozzle Tool set (comprising nozzle puller, nozzle puller , milling cutter, compressed air adapter, thread tap and plastic case) makes it possible to remove the injector nozzles correctly.

KA-4034 Injector Nozzle Puller for Mercedes CDI

Suitable for Mercedes CDI engine OM 668 e.g. A-Class.
The injector nozzle puller makes it possible to remove even nozzles that are a very tight fit in the cylinder head, without the cylinder head having to be removed from the engine.

KA-4033 Glow Plug Tool Set

- For Mercedes CDI engines
- Suitable for Mercedes CDI engines OM 611, 612 and 613.
- The glow plug tool set KA-4033 enables the correct removal of burnt and/or stuck due to corrosion or torn off glow plugs as well as the repair of the glow plug retaining thread.
- The cylinder head does not have to be removed.

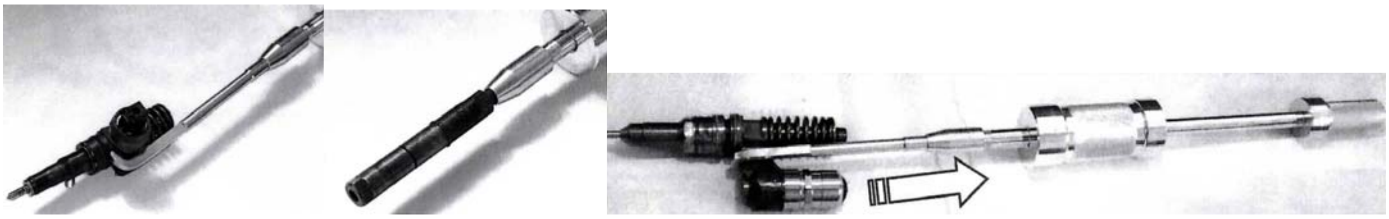
(Note: Screwing the compressed air adapter into the injector nozzle bore and injecting compressed air into the combustion chamber prevents dirt and metal particles from entering the combustion chamber)

Advantage:

- Large time saving and cost saving
- Clean working methods.
- The tool is easy to operate.

KA-3676 Truck Injectors Solution

- Injector puller solution SSANGYONG & MERCEDES
- Special Injector puller solution for new generation trucks
- Application rang: SSANGYONG, MERCEDES, trucks with injector-Pump systems or with traditional truck injectors (Volvo, scania, Mercedes, man, Renault, iveco, etc...)
- Content:
  - KA-3676-01 socket for Delphi injectors & Trucks
  - KA-3676-02 Injector “hook”
  - KA-3676-03 Extension handle
  - KA-3676-04 Upper handle
  - KA-3676-05 Body-tamper
  - KA-3676-06 Cardanic joint
  - KA-3676-07 M18 x 1.5 nut



KA-3664 VW. AUDI Common Rail Diesel Injector (TDI)

- Special two jaws design to fix the injector and pull out with slide hammer
- Applicable: VW, AUDI (TDI) engine

KA-3665

KA-3665A

KA-3665 KA-3665A
VW. AUDI Injectors Remover Set (FSI)

- Use "U" sleeve or two jaws hook to fix the injector and then pull out with slide hammer
- Applicable: VW, AUDI (FSI) engine

KA-3694

KA-3694A

KA-3694 KA-3694A
Injectors Pump Extractor Remover Set

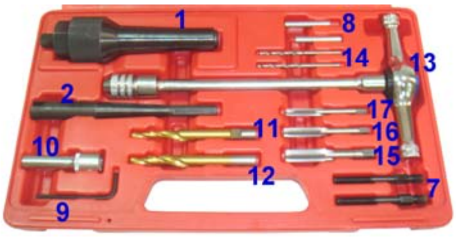
- Use "U" sleeve or two jaws hook to fix the injector and then pull out with slide hammer.
- Special two jaws design to fix the injector and pull out with slide hammer.
- Application range: VW, AUDI (TDI) (FSI)
  VW, AUDI, SEAT, SKODA
  VW,AUDI TDI engine code :
  ALH/AHU/1Z

KA-3677 Solution For BMW Common Rail Injectors

- Complete set for removing *BMW CR* Injectors without dismounting the cylinder head.
- Equipped with a blower adapter to clean the injector seats.
- Bosch injectors: common rail injectors mounted on BMW
- Application Engines: BMW Common Rail : M47TU, M57, M57TU
- Content:
  KA-3677-01 M17-M16 screw with num
  KA-3677-02 Hexagonal wrench to remove the solenoids
  KA-3677-03 Main extractor's body
  KA-3677-04 2 pcs x 140mm support foot
  KA-3677-05 2 pcs x 115mm support foot
  KA-3677-06 Ch.29 socket with 1/2 connection to remove the electronic group

KA-3678
Removing and Cleaning BMW Injectors Common Rail Diesel

- Complete set for removing *BMW CR* Injectors without dismounting the cylinder head.
- Equipped with a blower adapter to clean the injector seats.
- Bosch injectors: common rail injectors mounted on BMW
- Application Engines: BMW Common Rail : M47TU, M57, M57TU , M87, M87TU



KA-4296 Glow Plug Removal Set

Diesel Engine requires GLOW PLUG for combustion process in engine cylinder. The heating element in glow plug heat up and drive the cylinders gradually. But the heating elements are very delicate, and require special tool for removing the glow plug. KA-4296 is the best tool set for successful removal of glow plug.

Specification

Parts No.		Parts No.	
1	Hex 12mm spindle, Hex 30mm nut, cone center tool	11 12	7 x 5.5 9 x 5.5
2	Drill installer	13	T-handle
7	1/4” -28 UNF, Hex 9mm –2pcs	14	Ø3.5 drill –2pcs
8	Ø6 x 3.5 x 40L –2pcs	15	M10 x P10
9	Alley key	16	M8 x 1.0
10	9.7mm square socket	17	1/4” – 28UNF

KA-3699 Injector Puller for VAG

models with TDI-PD systems

Features:

- Specially designed for TDI-PD systems
- Slide hammer with special PD puller
- Supplied with Vice Clamp suitable for use with traditional injectors.

KA-2074 KIA/Hyundai Injector Remover Kit

- Remove injector from most of Korean vehicles.
- Applicable vehicle:
  Hyundai: STAREX, LAVITA, MATRIX, TRAJET, TERRACAN, SANTA FE(SM), LIBERO, AVANTE XD, GRANDEUR XG GETZ, TUCSON, NF SONATA, 06’ ACCENT.
  KIA: CARNIVAL, RIO, CARENS, CERATO, OPTIMA, PICANTO, SORENTO, SPORTAGE, GRAND CARNIVAL.

KA-2074A Universal Injector

- The kit is mainly for Bosch injectors and covers a long row of car types, suitable for Opel, Ford, Psa group, Fiat, Lancia, Alfa, Kia, Hyundai, Toyota, Mazda, Suzuki, Iveco, Volvo.
- For demounting of firing burnt injectors without demounting the cylinder head.
- Suitable for 1.3, 1.6, 1.9, 2.0 and 2.2 diesel engine.

KA-2089 Injector Removal Tool Model FOSI

For the extraction of extremely seized injectors. With the precisely tailored specifically for this.
Application designed extractor the injectors can be extracted hydraulically and / or mechanically.

	Engine	Type
Fiat	Multijet 1.3/16V – 1.6/16V – 1.9/16V – 2.0/16V – 2.3, 3.0	500, Punto, Grande Punto, Panda, Idea, Doblo, Stilo, Qubo, Bravo, Sedici, Croma, Ducato
Lancia	Multijet 1.3/16V – 1.6/16v – 1.9/16V – 2.0/16V	Ypsilon, Musa, Delta
Alfa	1.3/16v – 1.6/16V – 1.9/16V – 2.0/16v	MiTo, 147, 159, BRERA
Opel	1.3 CDTI – 1.9 CDTI – 2.0 CDTI	Corsa (C-D), Agila(B), Meriva, Astra(H), Astra GTC, Tigra(B), Combo Tour, Vectra(C), Insignia, Zafira(B)
Suzuki	1.3 DDiS 16V – 1.9 DDis 16V	Ignis, Splash, Swift, Wagon R+, Sx4, Grand Vitara
Ford	1.3 Duratorq	Ford Ka ‘09
Iveco	3,0 l	Daily
PSA	3,0 l	Boxer, Jumper

KA-2160 Diesel Injector Puller

- Suitable for the removal of stubborn Bosch/Delphi diesel injectors.
- Set includes 6 adaptors for different removal methods.
- Features a flexible joint adaptor allowing the slide hammer to be used in restricted areas.
- Content:
  1. Connecting thread (injector nozzle): M18 x 1.5
  2. Slide hammer: 4.8kg
  3. Universal joint: M18 x 1.5
  4. Pull spindle: M14 x 1.5, M16 x 1.0, M17 x 1.0, M20 x 1.0, M25 x 1.0, M27 x 1.0
  5. Special bit insert hex 10mm: Ø7.6 x Ø4.8, Ø6.6
  6. Special socket insert 25mm, 27mm, 29mm, 30mm hex.
  7. Adaptor:

size	application	size	application
M14 x 1.5	BMW M47 BMW211 CDI	M20 x 1.0	Denso
M16 x 1.0	Toyota 2.2	M25 x 1.0	Siemens
M17 x 1.0	MB Bosch	M27 x 1.0	Siemens

KA-2160A 14pcs Injector Extractor W/Slide Hammer

- For Removing Stuck And The Seized Common-Rail Injectors Without Dismount The Cylinder Head.
- For All Injection Nozzle Cars.

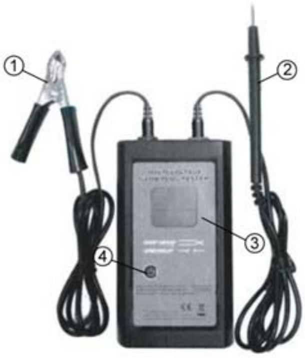
Contents:
Slide hammer: 3.9KGS
Adaptor: M14 x 1.5 for DELPHI
Adaptor: M17 x 1 for Bosch
Adaptor: M20 x 1 for DENSO
Adaptor: M24 x 1 for SIEMENS
Adaptor: M27 x 1 for SIEMENS
Adaptor: M27 x 1.0 for Bosch injector nozzle
Adaptor: Puller W/M14x 1.5P
4 pcs Injection nozzle socket 100L-25-27-29-30mm 6PT

KA-2165 Diesel Injector Nozzle Extractor Set

Extraction injectors without dismantling the engine.
Extraction Bosch injectors.
For CDI engines 2.1 L and 2.2 L
Applicable Benz for Vito, Sprinter, Viano, C and E class, CLC, CLK.

KA-1053 Multi Voltage Glow Plug Tester

This glow plug tester is designed to test the condition of diesel engine glow plugs status quickly and easily on or off the vehicle be it a 12V or 24V system. Large graphics displays on its LCD screen makes it easy to read and understand the test results.



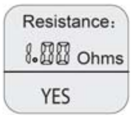
Content:
①. Ground Clip
②. Test Probe
③. LCD Display
④. Power Switch

Feature:

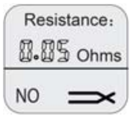
- Voltage supply by 9V battery.
- Tester probe / clip are easy to replace.
- Initialization for different testing probe / clip.
- Auto switch off.
- Rubber coating for tester protection.

Glow Plug Condition:

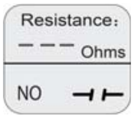
YES = GOOD



NO = SHORT CIRCUIT

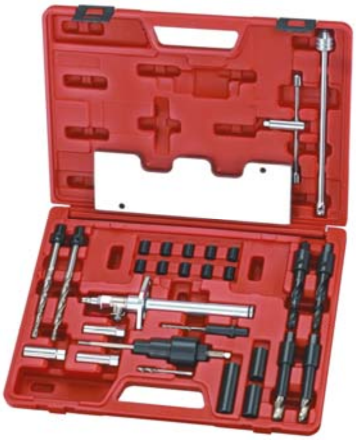


NO = OPEN CIRCUIT



The tester will display the resistance of the glow plug, which will help user to identify the condition of the glow plug by comparing the value with the specification of the glow plug.

KA-8383 Glow Plug Tool Set



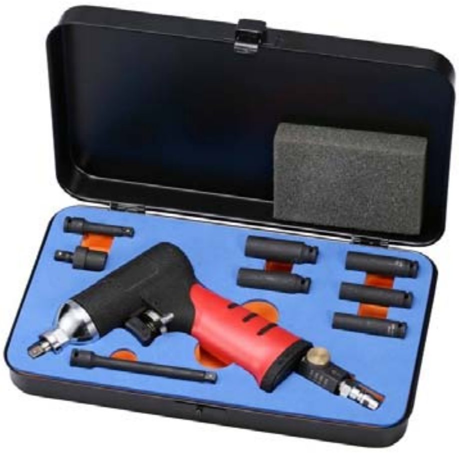
Removing damage / broken glow plugs from cylinder heads.
Including all required adaptors, centering and cleaning tools to safety remove the glow plug without damaging the engine.

Advantages: Time saving and cost saving
Operating easily.

Suitable for glow plug thread M10 x 1.0mm on VW-Audi V6 TDI engines:
2.5L (AFB, AKE, AYM, BAU, BCZ, BDG, BDH, BFC)
2.7L (BPP, BSG)
3.0L (ASB, BKN, BKS, BMK, BNG, BUN, BUG)

Tap Dimensions:
1/4” x 20UNC thread, M10 x 1.0mm thread M12 x 1.0mm thread
Glow plug applications: M10 x 1.0mm

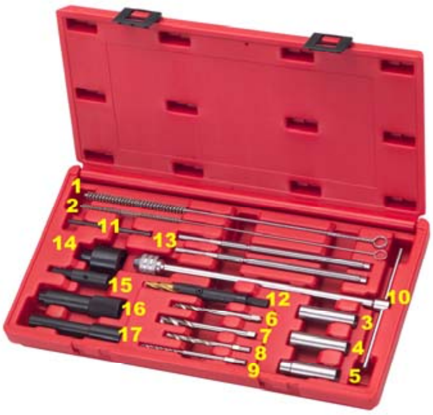
PA-1940 9pcs 1/4” Dr. Impact Glow Plug Removal Kit



* To be used with air compressor

- Ideal for removal, grip the diesel engine glow plugs

Content:
1pc 1/4” Dr. Impact wrench for diesel glow plug removal with a nozzle
Free speed: 10,000 R.P.M
Torque: 1=10Nm , 2=20Nm , 3=3Nm , 4=4Nm
Net Weight: 0.8kgs
Air Inlet: 1/4”
Exhaust system: Rear
Sug. Air pressure: 90 PSI
5pcs 1/4” Dr. Impact Socket: 8, 9, 10, 11, 12mm
2pcs 1/4” Dr. Impact Extension Bar: 50 & 100mm
1pc 1/4” Dr. Impact Universal Joint
Metal: CR-MO, Finish: Manganese phosphate



KA-8382 Damaged Glow Plug Removal & Cleaning Tool Set

- Removing damaged / broken glow plugs from cylinder heads.
- Suitable for glow plug thread M8 x 1.0mm
- Including all required adaptors, centering and cleaning tools to safety remove the glow plug without damaging the engine.

Contents:
1. Cleaning brush: 0.8mm x 100mm, overall length:300mm
2. Cleaning brush: 0.5mm x100mm, overall length:300mm
3. 1/4" drive stud puller 2.5mm
4. 1/4" drive stud puller 3.5mm
5. 1/4" drive stud puller 4.0mm
6. Thread tap: #12-28
7. Thread tap: M8 x 1.0
8. Drill 4.5mm
9. Drill 2.5mm
10. 3 Jaws driver with T-handle
11. 2pc locking pin ψ4.25*34mm
12. Ø7 x Ø4.5 milling tool
13. 2pc special glow plug pulling tool M8 x 1 / #12-28
14. Glow plug extractor, M8 x 1
15. Adapter for power drill
16. Puller holder M8 x 1.0 thread
17. Puller guide bushing

KA-8382A 27pcs Glow Plug Tool Set

Designed to remove damaged/broken glow plug from cylinder heads.
Set includes all required adaptors, centering and cleaning tools to safety remove the glow plug without damaging the engine.

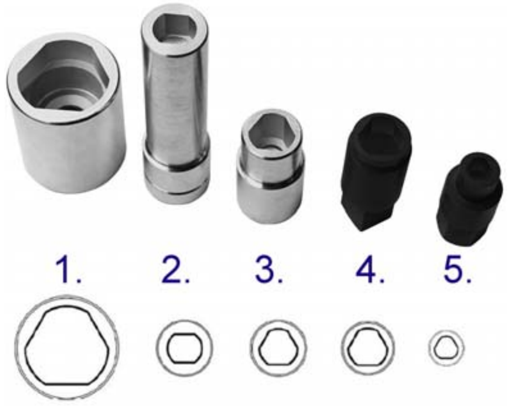
1PC – Core drill Ø8.1 for M9 × 1.0 thread
1PC – Thread tap M9 × 1.0
1PC – Core drill Ø 9.1 for M10 × 1.0 thread
1PC – Thread tap M10 × 1.0
1PC – Milling cutter for glow plug electrode
1PC – Thread tap M8 x 1.0
1PC – Core drill Ø 5.5 for NO.12 × 28 UNF thread
1PC – Thread tap NO.12×28 UNF
1PC – Adapter for power drill
1PC – Special drill Ø 2.6
2PC – Special drill stand
2PC – Tie bolt M8 × 1.0 (180mm long)
1PC – Glow plug extractor, M8 x 1 (Bearing)
1PC – Puller guide bushing
1PC – Puller holder M8x1.0 thread
3PC – Glow plug top remover 2.5, 3.5, 4mm
1PC – Jaws driver with T-handle
1PC – Drill guide bushing Ø17.5 × 38
1PC – Drill guide bushing Ø17.5 × 63
1PC – Cleaning brush: 5.3mm x 100mm, overall length: 300mm
1PC – Cleaning brush: 9mm x 100mm, overall length: 300mm
1PC – Cleaning brush: 10mm x 100mm, overall length: 300mm
1PC – 1/2" Sq. Drive Adapter (10mm HEX)

KA-8038 Universal Injector Sealing Seat Cleaning & Milling Set

- This is the optimized version of the cleaning and milling tool set. The advantages are clearly obvious.
- Can be used with HDi engines, diesel direct injection and common rail engines with BOSCH and DELPHI injectors.
- Shaft cleaning by brushes with machine drive, sealing seat cleaning with cutter 120° Ø21mm; 17mm stepped, miller 0° Ø17mm continuous, miller 0° Ø19mm; 17.0mm; 15.0mm stepped.
- Universal sealing ring puller for seized sealing rings.
- Material: S45C steel PH black and zinc finish

KA-5295
21pcs Injector Removal and Dismantling Set

Contents:	Application
Universal joint: M18×1.5	
Special bit insert hex 10mm × Ø7.6	1x special-use Allen SW10 with 7.5 mm bore, 1/2 drive, to remove the fixing ring, for example, Bosch injectors at MB CDI and PSA HDI
Special bit insert hex 10mm × Ø 6.6	For releasing the internal screw of the CR injectors.
Pull Spindle: IT M16 × 1.0	For Denso (Toyota 2.2D)
Pull Spindle: IT M17 × 1.0	For Bosch injectors, e.g., Alfa, BMW, Fiat, MB, PSA, Renault
Pull Spindle: IT M20 × 1.0	For Denso
Pull Spindle IT M25 × 1.0	Siemens injectors, e.g. PSA (DW10)
Pull Spindle IT M27 × 1.0	Siemens injectors, e.g. PSA (DW10)
Pull Spindle OT M16 × 1.5	Pull Adapter for M16 x1.5 thread, such as used in Facom tools
Pull Spindle OT M14 × 1.5	Internal thread for Bosch / Delphi Injectors, e.g. MB (OM 629/642/646), PSA (DV4 / DW12), VW (CBD), BMW (M47)
Pull Spindle OT M25 × 0.5	For Denso
Pull Spindle OT M25 × 0.75	For Denso
Pull Spindle OT M27 × 1.0	For Siemens, e.g. Citroen C5 / Jumpy / Xsara, Fiat Ducato JTD, Peugeot 206/307/406 / Boxer (2.0 / 2.2 / 2.3 HDI) Mercedes-Benz CDI (except A-Class (Sprinter / Vito)
Special socket (25mm)	For Siemens Injectors - 2.0 Hdi (DW Series) As found on PSA, Ford, Toyota etc
Special socket (27mm)	For Siemens Piezo Injectors – 2.0 Hdi Piezo (DW Series) As found on PSA etc
Special socket (29mm)	For Bosch type injectors – Bosch Cdi / Hdi engines
Special socket (30mm)	For Bosch type injectors – Bosch Renault / Nissan 1.9dCi
Injector gripper(12MM)	For MB CDI-engines, except Sprinter, Vito and A-class
Injector gripper(13.5MM)	For Opel Renault F9Q
Injector gripper(16MM)	For Fiat Ducato JTD, Citroen C5, Xsara, Jumpy and Jumper HDI and Peugeot 206, 307, 406, Boxer HDI (2.0, 2.2, 2.3I)
Injector gripper(26MM)	For Opel Z19DT / Z19DTH / Z19DTL engines, A20DTH (LBS) / A20DTR (LBY) / A20DTJ (LBX) / A20DTC (LCD) and Fiat 1.9 JTD



KA-5289 Bosch VE Pump Socket Set
KA-5289A Bosch Diesel Injection Pump Socket Kit

The special sockets are required to loosen and remove the triangular headed screws on the injection pump.

For Bosch diesel injection pump VE (Bosch VE)

1. Triangular socket for central closing plug
2. Govening pressure socket
3. Triangular socket for bearing screws governing lever

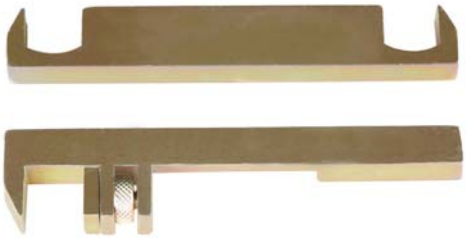
For Bosch diesel injection pump VP EDC TDI (Bosch TDI)

4. Triangular socket for top cover screw

For Bosch diesel injection pump VP 37 (Bosch CR)

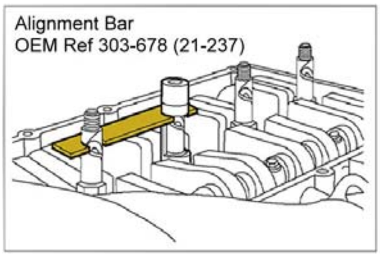
5. Triangular socket for body

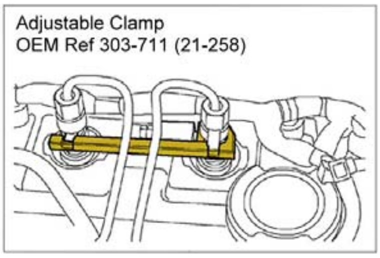
Contains ITEM	1	2	3	4	5
KA-5289	•	•	•		
KA-5289A	•	•	•	•	•



KA-5319 Diesel Injector Alignment Tools

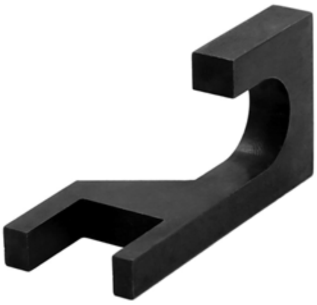
- Tools designed to hold the injectors in place and align them with the fuel lines while the injectors are secure.
- It is essential to have the injectors correctly aligned to avoid the risk of a fractured pipe in service.
- Applications: Ford Duratorq (Puma) diesel engines 2.0/2.2/2.4 litre Di / TDCi / TDdi
  Ford: Mondel Mk3 (2000-2007), Transit (2000-2006)
  Jaguar: X-Type 400 (2003-2009)





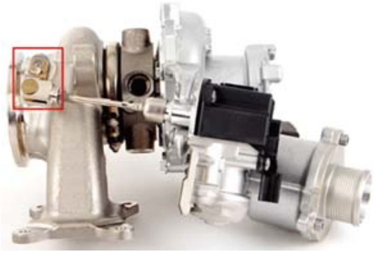
KA-3752 Universal Special Removal Kit For Glow Plugs Tip

- Special kit for the extraction of the electrode terminal part of the glow plugs (M10, M9, M8) in the event of breakage or seizure inside the seat, otherwise impossible to remove.
- The kit allows simple removal operation, thus avoiding the engine head removal.
- Glow plug guide: M10 x 1 – M10 x 1.25 – M9 x 1 – M8 x 1



KA-3762
Wastegate Setting Gauge (VAG group)

- Used to locking the wastegate.
- Druing adjustment work on the charge pressure electric actuator of the exhaust turbocharger on 4-cyl. 1.8L, 2.0L 4V TFSI direct injecion engine (generation III).
- Suitable for various VW and Audi models: Audi A3 2013>, Seat Leon 2013>...
- OEM Ref. T40290

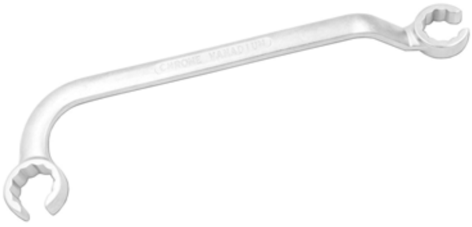


KA-5357 Puller For Clutch Release Shaft

- Intended for the removal of the clutch release shaft.
- This tool is needed when removing the gearbox, for example when replacing clutches or for gearbox repairs.
- For pulling type clutches fitted to: Mercedes, BMW, Fiat Ducato (1994 on)

KA-2054B 4pcs Injector Nozzle Tools

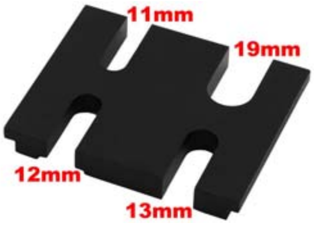
- Universal joint adaptors have a M18 x 1.5 internal thread to allow the use of slide hammers.
- Applications: Bosch and Delphi Common Rail Diesel Injectors.



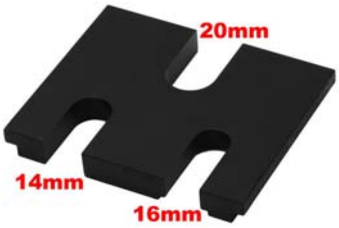
Diesel Injection Line Wrench

For removing and installing the fuel injection line on diesel engines.
Multiple angles / offsets for easy access.
Suitable for most diesel engines – TDI(17mm), HDI(14mm), etc.
OEM Ref. VW 3035.

KA-7289-17	17mm
KA-7289-14	14mm



KA-5384A



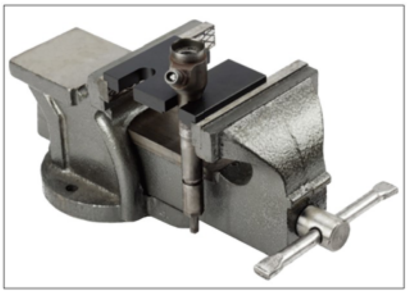
KA-5384B

KA-5384 Injector Holding Fixture

- For holding of injectors when servicing (dissassembly and reassembly).
- Suitable for injectors such as Bosch, Delphi, Denso, Siemens and others.
- Can be easily mounted on the bench vise.

KA-5384A : 11mm, 12mm, 13mm, 19mm

KA-5384B : 14mm, 16mm, 20mm



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1. Essential Safety Notices

⚠ Before using the injector nozzle puller set, it is imperative to read and understand the instruction manual. Misuse can lead to SERIOUS or FATAL INJURIES.
This instruction manual is part of the injector nozzle puller set. Store the instruction manual in a safe place for any further use and give it to subsequent users of the injector nozzle puller set.
All specific vehicle data stated herein are supplied under reserve and without commitment.

1.1 Safety notices and warnings

For better differentiation, the warning notices in this instruction manual are classified as follows:

Warning sign	Sign reads	Meaning
⚠	**DANGER**	Indicates a hazardous situation which, if not avoided, may result in **serious or fatal injuries**.
⚠	**CAUTION**	Indicates a hazardous situation which, if not avoided, may result in **moderate or minor injuries**.
	ATTENTION	Indicates a situation which, if not avoided, may result in damage to the injector nozzle puller set or its functioning, or to objects in its vicinity.

⚠ **DANGER**

When removing an injector nozzle, there is a risk that the pull spindle will break and fall into pieces. This will lead to parts or the pull spindle becoming projectiles.

- Do not use an impact wrench or any extensions!
- Only use genuine KLANN spare parts.
- Always keep all parts of your body away from the axial extension of the pull spindle.

⚠ **CAUTION**

A falling tool can cause injuries.

- Always wear safety shoes / boots.

ATTENTION

There is a risk of damage to the vehicle and tool.

- Lubricate the pull spindle with molybdenum disulphide paste **KL-0014-0030**.
- Always perform any work on vehicles in strict compliance with the directions, provisions, and safety regulations issued by the vehicle manufacturer.
- Only the vehicle manufacturer’s data apply to all work done on the vehicle.

1.2 Personal protective equipment

ALWAYS wear personal protective equipment when using the injector nozzle puller set. The injection nozzle puller set can cause mechanical hazards leading to injuries such as contusions, cuts or concussions.

EYE PROTECTION (see OSHA 29 CFR 1910.133 and ANSI Z87) designed to protect you from flying objects must be worn when using the injector nozzle puller set.

- Particles may fly upward while working with the injector nozzle puller set and could cause serious injuries to your eyes.

SAFETY GLOVES must be worn when using the injector nozzle puller set .

- Working with the injector nozzle puller can cause skin abrasions and contusions.

SAFETY SHOES/BOOTS with slip resistant soles and steel-toe caps (see OSHA 29 CFR 1910.136 and ANSI 241) must be worn when using the injector nozzle puller.

- Falling parts can cause serious injuries to feet and toes.

1.3 Intended use

⚠ The injector nozzle puller set must only be used to remove injection nozzles featuring a injector nozzle connecting thread M14 x 1.5 (external thread) or M17 x 1 (internal thread).

The injector nozzle puller set may only be used according to the directions and provisions specified in the instruction manual.

- Any other use can result in moderate or minor injuries.

1.4 Safe and proper use

Take the following safety precautions to prevent injuries and damage that could be caused by improper handling or unsafe use of the injector nozzle puller set.

⚠ Misuse can result in moderate or minor injuries.

- NEVER exceed the admissible load capacity of the injector nozzle puller set.
- Do not use an impact wrench or any extensions!
- Always check the injector nozzle puller set prior to EACH use to ensure that it is in good order and condition.
- Damaged or worn parts MUST be replaced prior to use.
- ONLY use Original KLANN spare parts and accessories for the injector nozzle puller set.

1.5 Work environment

Safe working with the injector nozzle puller set is only possible if the work environment is safe:

- The workplace must always be clean and tidy.
- The workplace must be sufficiently large and secured.

1.6 Appropriate users

This instruction manual is designed for technicians in workshops.

DO NOT allow children to use the injector nozzle puller set.

Purchasers / employers purchasing the injector nozzle puller set MUST ensure that any person / employee using the injector nozzle puller set have read and understood this instruction manual prior to using the set. This instruction manual MUST be made available to the users of the injector nozzle puller set / employees for reference at all times.

Fig. 1: **KL-0186-14 K**

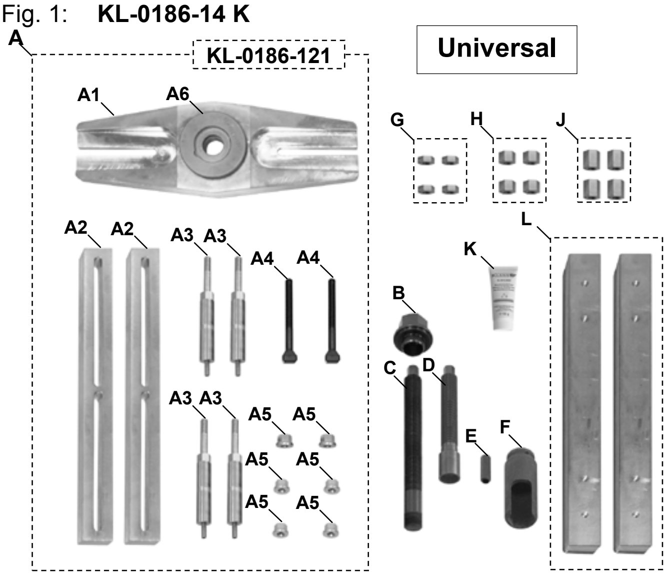
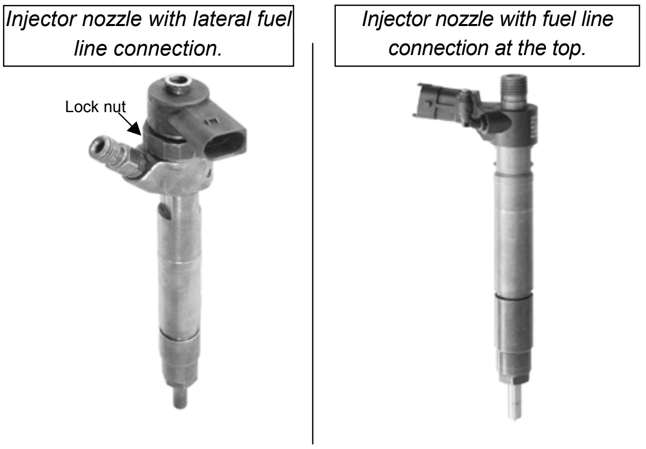


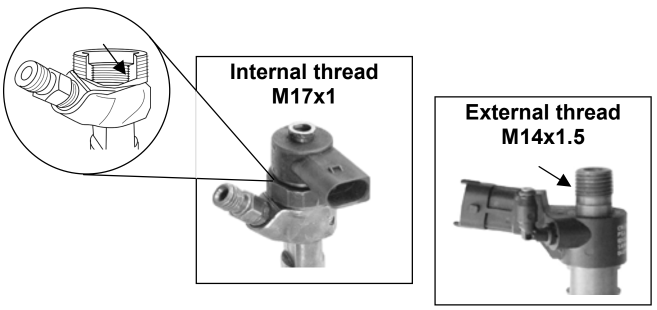
Fig. 2: **Injector nozzles.**



Injector nozzle with lateral fuel line connection.

Injector nozzle with fuel line connection at the top.

Fig. 3: **Injector nozzles connecting threads.**



2. Product Description

2.1 KL-0186-14 K Injector Nozzle Puller Set

Universal with accessories

(German Utility Model)

Universally suitable for diesel engines with injector nozzle connecting thread M 14x1.5 (external thread) or M 17x1 (internal thread), for example, on:

Mercedes: OM611, OM612, OM613, OM 628*, OM 629*;
OM 642*, OM646, OM647, OM648
Peugeot, Citroen, Fiat, Lancia, Suzuki: DV6, DW10, DW12
Ford: 1.6 TDCi (G8DA, G8DB, HHDA, HJA, HHJB)
VW-Audi: 2.5 / 2.7 / 3.0 V6 Tdi
Volvo: 1.6 D (D4164T), 2.2 D
Mazda: Y6 (DV6)

***NOTE:** V-engines might require the removal of the engine due to space constraints.

The injector nozzle puller **KL-0186-14 K** enables the removal of very tight-fitting injector nozzles to be performed directly on the vehicle without having to dismount the cylinder head.

The special extraction bridge and the pull spindle allow the user to extract the injector nozzle quickly and easily.

The extraction bridge is supported either by the support bolts that are screwed into the supporting bores holes of the valve cover screws (M6) or by the support bars that are positioned on an even surface on the cylinder head. The spacer nuts allow the supporting surfaces to be levelled out, as well as the support bolts in holes with insufficient depth to be adjusted.

A	**Extraction bridge without spindle**
A1	Base plate
A2	Support bar (2 pieces)
A3	Support bolt M6 (4 pieces)
A4	T-slot screw M8 (2 pieces)
A5	Shoulder nut M8 (6 pieces)
A6	Adaptor with axial bearing
B	Shoulder nut M16 x 1.5
C	Pull spindle M17 x 1, 200 mm long
D	Pull spindle M14 x 1.5, 127 mm long
E	Special bit insert (waf) 10 mm
F	Special socket (waf) 29 mm ½“ drive
G	Set of spacer nuts 5 mm (4 pieces)
H	Set of spacer nuts 10 mm (4 pieces)
J	Set of spacer nuts 15 mm (4 pieces)
K	Molybdenum disulphide paste 50 g
L	Set of support bars (2 pieces)

2.2 Technical data

Injector nozzle connecting thread featuring internal thread: M17x1
Injector nozzle connecting thread featuring external thread:.........M14x1.5
Maximum load capacity of the extraction bridge: .... 12 t

3. Preparatory Work

Before using the injector nozzle puller set for the first time, check and confirm you have all parts listed in the scope of delivery. Then, follow the mounting instructions.

3.1 Checking delivery (Fig. 1)

3.2 Preparing the vehicle

1. Loosen and/or remove all necessary components.
2. Unscrew the injector nozzle fixing parts.
3. Disconnect wires.
4. Unscrew injection lines.

Fig. 4: **Unscrew injector nozzle lock nut and remove threaded ring.**

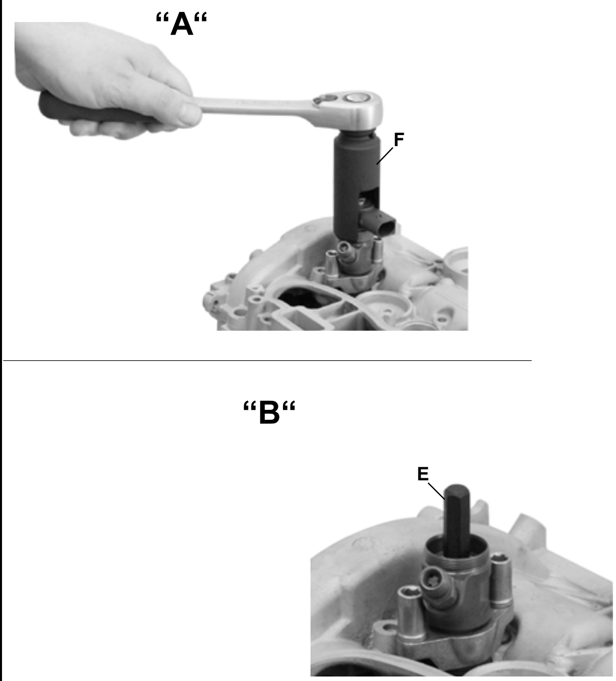
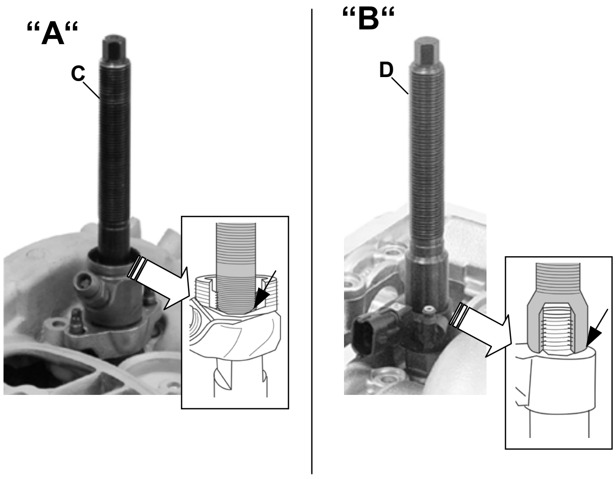


Fig. 5: **Screwing pull spindle M17 x 1 into injector nozzle or screwing pull spindle M14 x 1.5 onto injector nozzle.**



4. Removing the Injector Nozzle

These instructions describe how to remove a tight-fitting injector nozzle from the cylinder head.

1. Choose the appropriate pull spindle:
   Use pull spindle **“C“** (M17 x 1) or pull spindle **“D“** (M14 x 1.5) depending on which **type of injector nozzle (Fig. 2)** has been installed.

1.1 Pull spindle **“C“ (M17x1):** *Injector nozzle with lateral fuel line connection.*

NOTE:

If the special socket **“F“** does not fit the lock nut, the wire connection will have to be twisted by means of the special socket **“F“** until the latter can be slid onto the lock nut.

Using special socket **“F“** , unscrew the injector nozzle lock nut **(Fig. 4 A)** and remove the upper part.

Remove all inner parts of the injector nozzle and unscrew the threaded ring using the special bit insert **“E“**. **(Fig. 4 B)**

ATTENTION

Risk of damage to the pull spindle and injector nozzle.

- Lubricate pull spindle with molybdenum disulphide paste **KL-0014-0030**.
- Always, completely screw the pull spindle into the injector nozzle.

Completely screw the pull spindle **“C“** into the injector nozzle. **(Fig. 5 A)**

1.2 Pull spindle **“D“ (M14x1.5):** *Injector nozzle with fuel line connection at the top.*

ATTENTION

Risk of damage to the pull spindle and injector nozzle.

- Lubricate pull spindle with molybdenum disulphide paste **KL-0014-0030**.
- Always, completely screw the pull spindle onto the injector nozzle.

Completely screw the pull spindle **“D“** onto the injector nozzle. **(Fig. 5 B)**

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Fig. 6: **Screwing in support bolts**

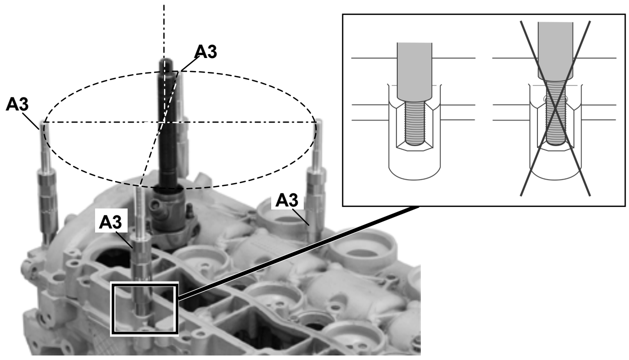


Fig. 7: **Placing support bars onto support bolts.**

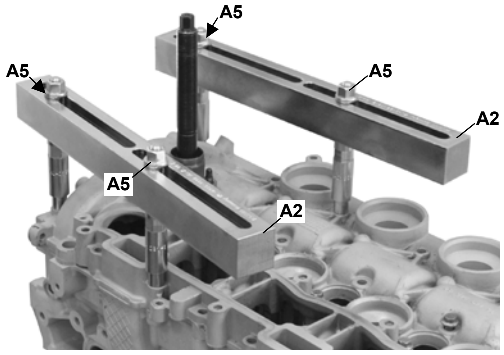
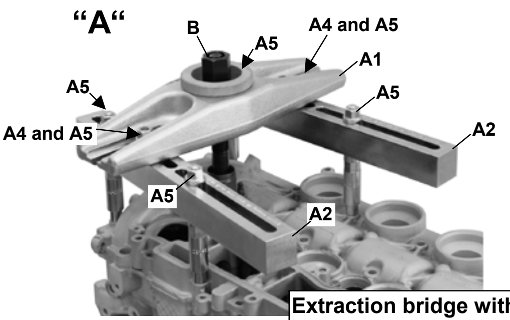


Fig. 8: **Mounting extraction bridge**



Extraction bridge with support bars

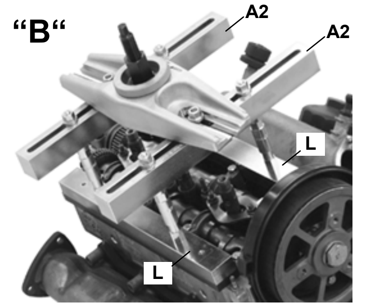
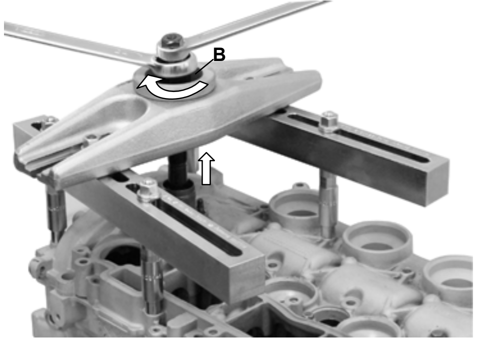


Fig. 9: **Extracting injector nozzle**



2. ***ATTENTION***

   Risk of damage to the cylinder head.

   - The supporting holes have to be chosen so that, if possible, they are positioned on the solid material of the cylinder head and arranged with the supporting surfaces almost symmetric relative to the injector nozzle.
   - The support bolts have to be screwed in so that the supporting surfaces for the support bars are on the same level and that the support in the holes is given by both the thread and the surface, and not only by the thread. **(Fig. 6)** Use spacer nuts **"G"**, **"H"** or **"J"** if necessary.
   - If the support via the valve cover supporting holes is not possible but the cylinder head has an even surface, the support bars **"L"** can be used. **(Fig. 8 B)**

   Unscrew the valve cover screws (4 pieces) out of the relative supporting holes. Then, screw the support bolts **"A3"** into these holes. **(Fig. 6)**

3. ***ATTENTION***

   Risk of damage to the tool.

   - The support bars **"A2"** must rest level, straight-lined and in true alignment on the support bolts; only then will an optimal support be ensured.

   Place the support bars **"A2"** onto the support bolts.
   Tighten shoulder nuts M8 **"A5"** to approx. 10 Nm. **(Fig. 7)**

4. Mount the extraction bridge as shown in **Fig. 8 A.** To do this, place base plate **"A1"** onto pull spindle **"C"** and onto support bars **"A2"**. Screw shoulder nut **"B"** onto pull spindle **"C"** until the nut rests on the base plate or on the adaptor with axial bearing **"A6"**.
   Tighten shoulder nuts M8 **"A5"** on the T-slot screws **"A4"** to a torque of approx. 10 Nm.

5. ⚠ **DANGER**

   When removing an injector nozzle, there is a risk that the pull spindle could break and fall into pieces. This will lead to parts or the pull spindle becoming projectiles.

   - Do not use an impact wrench or any extensions!
   - Only use genuine KLANN spare parts.
   - Always keep all parts of your body away from the axial extension of the pull spindle.

   ATTENTION

   Risk of damage to the pull spindles and injector nozzle.

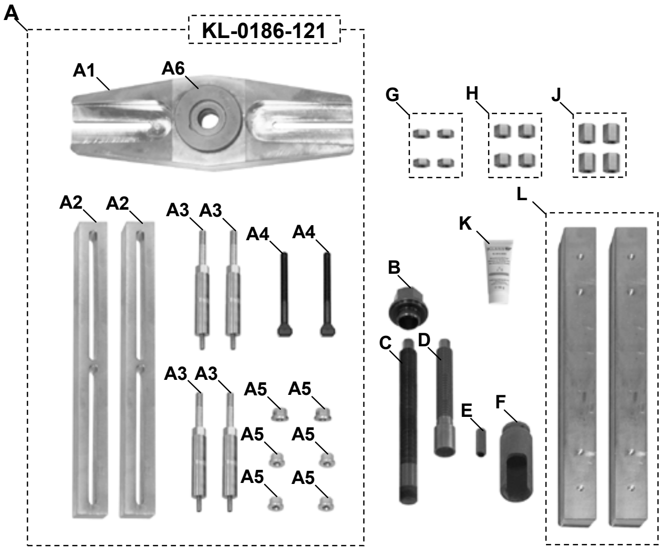
   - Prevent pull spindle **"C"** or pull spindle **"D"** from turning while screwing in the shoulder nut **"B"**.

   Extracting injector nozzle. For this, screw in the shoulder nut **"B"** until the injector nozzle can be removed from its bore hole. **(Fig. 9)**

5. Care and Storage

ATTENTION: Petroleum ether and chemical solvents can damage plastic parts. Always clean all parts after their use with a clean cloth.
In order to protect against corrosion, lightly lubricate all metal parts after their use and store them in a clean and dry place.

Fig. 10: **Spare Parts Overview KL-0186-14 K**



Upgrade Kits

Fig. 11: **KL-0186-1232**

Fig. 12: **KL-0186-1233**

Fig. 13: **KL-0186-1234**

6. Maintenance and Repair by the KLANN Service Centre

For safety reasons, as soon as damage is noticed on the injector nozzle puller set, immediate steps must be taken to prevent it from being used. For professional checking and repair of the tool, please contact the KLANN Service Centre.

Address:
KLANN Spezial-Werkzeugbau-GmbH
Breslauerstr. 41
D-78166 Donaueschingen
Tel.: 0771 83 22 371
E-Mail: service.de@klann-online.de

For additional information concerning the use of our injector nozzle puller set, please contact the KLANN Service Centre.

7. Spare Part List KL-0186-14 K

Pos.	Part No.	Description	Qty.
	KL-0186-14 K	**Injector nozzle puller set universal**	**1**
	consists of:		
A	**KL-0186-121**	**Extraction bridge without spindle**	**1**
B	KL-0186-1215	Shoulder nut M16 x 1.5	1
C	KL-0583-1005	Pull spindle M17 x 1, 200 mm long	1
D	KL-1383-1113	Pull spindle M14 x 1.5, 127 mm long	1
E	KL-0369-4505 A	Special bit insert (waf)10 mm	1
F	KL-0369-461 A	Special socket (waf) 29 mm ½“ drive	1
G	KL-0186-1251	Set of spacer nuts 5 mm (4 pieces)	1
H	KL-0186-1252	Set of spacer nuts 10 mm (4 pieces)	1
J	KL-0186-1253	Set of spacer nuts 15 mm (4 pieces)	1
K	KL-0014-0030	Molybdenum disulphide paste 50 g	1
L	KL-0186-122	Set of support bars (2 pieces)	1
	KL-0186-1290	Plastic storage case	1

Pos.	Part No.	Description	Qty.
A	**KL-0186-121**	**Extraction bridge without spindle**	**1**
	consists of:		
A1	KL-0186-1211	Base plate	1
A2	KL-0186-1212	Support bar	2
A3	KL-0186-1231-1	Support bolt with set screw M6	4
A4	KL-0186-1213	T-slot screw M8	2
A5	KL-0206-1011	Shoulder nut M8	6
A6	KL-0186-1214	Adaptor with axial bearing	1

8. Upgrade Kits

KL-0186-1232 Set of Support Bolts M8

Suitable for Fiat Ducato and Iveco 2.3; 2.4 and 3.0 JTD Common-Rail Diesel engines.

The support bolt set **KL-0186-1232** enables the injector nozzle puller set **KL-0186-14 K** also to be used for the above mentioned engines.

consists of:

Part No.	Description	Qty.
KL-0186-1232-1	Support bolt with set screw M8	4

KL-0186-1233 Set of Support Bolts M6

Suitable for Vauxhall / Opel Antara 2.0 CDTI. (engine code: Z 20 DM, Z 20 DMH)

The support bolt set **KL-0186-1233** enables the injector nozzle puller set **KL-0186-14 K** also to be used for the above mentioned engines.

consists of:

Part No.	Description	Qty.
KL-0186-1233-1	Support bolt with set screw M6	4

KL-0186-1234 Set of Support Bolts M6

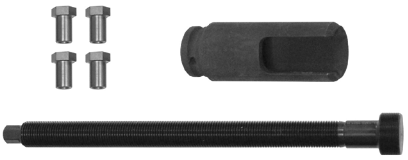
Suitable for Renault, Nissan, Vauxhall/Opel 2.2 L and 2.5 L dCi Diesel engines (engine code: G9T and G9U) e.g. Renault: Avantime, Espace III, Espace IV, Laguna II, Master II, Master III, Traffic II, Vel Satis; Nissan: Interstar, Primastar and Vauxhall/Opel Movano, Vivaro.

The support bolt set **KL-0186-1234** enables the injector nozzle puller set **KL-0186-14 K** also to be used for the above mentioned engines.

consists of:

Part No.	Description	Qty.
KL-0186-1234-1	Support bolt with set screw, 113.5mm	2
KL-0186-1234-2	Support bolt with set screw, 150 mm	2

Fig. 14: **KL-0186-150**



KL-0186-150 Upgrade Kit (HDI)

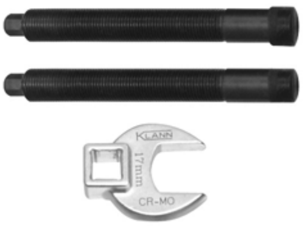
Suitable for PSA 2.7 Hdi engines.

The upgrade kit **KL-0186-150** enables the injector nozzle puller set **KL-0186-14 K** also to be used for the above mentioned engines.

consists of:

Part No.	Description	Qty.
KL-0186-1254	Set of spacer nuts 20 mm	1
KL-1383-1021 H	Pull spindle M25 x 1, 240 mm long	1
KL-1383-1022	Special socket (waf) 25 mm ½" drive	1

Fig. 15: **KL-0186-1610**



KL-0186-1610 Upgrade Kit

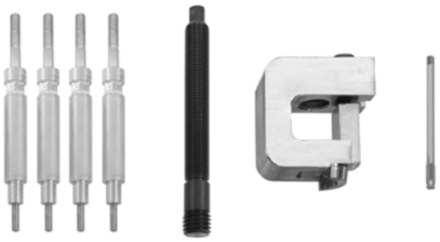
Suitable for Toyota 2.2 L Common-Rail Diesel engines (engine code: 2AD-FHV, 2AD-FTV)

The upgrade kit **KL-0186-1610** enables the injector nozzle puller set **KL-0186-14 K** also to be used for the above mentioned engines.

consists of:

Part No.	Description	Qty.
KL-0186-1611	Pull spindle M20 x 1, 145 mm long	1
KL-0186-1612	Pull spindle M16 x 1, 145 mm long	1
KL-4417-17	Open-end spanner insert, size 17mm	1

Fig. 16: **KL-0186-170**



KL-0186-170 Upgrade Kit

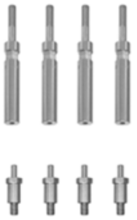
Suitable for Mercedes CDI engines OM651, for example C-Class (W204 2007onwards), E-Class (W212 2009 onwards), E-Class Coupé / Cabriolet (W207 2009 onwards), GLK (X204 2008 onwards) and Sprinter (II 906 2006 onwards).

The upgrade kit **KL-0186-170** enables the injector nozzle puller set **KL-0186-14 K** also to be used for the above mentioned engines.

consists of:

Part No.	Description	Qty.
KL-0186-1233	Set of support bolts M6	1
KL-0186-1711	Pull spindle M18, 145 mm long	1
KL-0369-420	Injector nozzle puller	1
KL-0369-511	Thread tap M7 with drill-bit	1

Fig. 17: **KL-0186-190**



KL-0186-190 Upgrade Kit

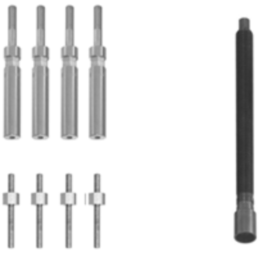
Suitable for Renault, Nissan, Vauxhall / Opel 3.0 L Common Rail Diesel engines (engine code: ZD3) e.g. Renault: Master II, Master III, Master Maxi; Nissan: Cabstar III, Instar, Patrol III, Patrol GR II, Terano and Vauxhall/Opel Movano II.

The upgrade kit **KL-0186-190** enables the injector nozzle puller set **KL-0186-14 K** also to be used for the above mentioned engines.

consists of:

Part No.	Description	Qty.
KL-0186-1236-2	Support bolt 145 mm	4
KL-0186-1255	Spacer nut with set screw	4

Fig. 18: **KL-0186-200**



KL-0186-200 Upgrade Kit

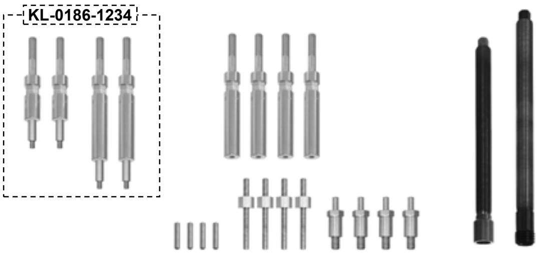
Suitable for Renault, Nissan and Vauxhall / Opel 2.0 dci Diesel engines (engine code M9R)

The upgrade kit **KL-0186-200** enables the injector nozzle puller set **KL-0186-14 K** also to be used for the above mentioned engines.

consists of:

Part No.	Description	Qty.
KL-0186-1236-2	Support bolt 145 mm	4
KL-0186-1237	Set screw with spacer nut	4
KL-0583-1032	Pull spindle M14 x 1.5, 200 mm long	1

Fig. 19: **KL-0186-210**



KL-0186-210 Upgrade Kit

Suitable for Renault / Nissan / Opel/Vauxhall 2.0 dCi (M9R), 2.2 dCi (G9T), 2.5 dCi (G9U) and 3.0 dCi (P9X, ZD3) Diesel engines.

The upgrade kit **KL-0186-210** enables the injector nozzle puller set **KL-0186-14 K** also to be used for the above mentioned engines.

consists of:

Part No.	Description	Qty.
KL-0186-1234	**Set of support bolts M6**	1
KL-0186-1236-2	Support bolt 145 mm	4
KL-0186-1235-2	Set screw M6x25 mm	4
KL-0186-1237	Set screw with spacer nut	4
KL-0186-1255	Spacer nut with set screw	4
KL-0583-1032	Pull spindle M14x1.5, 200 mm long	1
KL-0186-1611 H	Pull spindle M20x1, 250 mm long	1

9. Environmentally Safe Disposal

The injector nozzle puller set and the packaging material must be disposed of in compliance with the applicable national legal rules and regulations in force.

HEAVY-DUTY TOOLS

Quick Finder Index

- Engineered in the U.S.A.
- Lifetime Marathon Warranty®

Sleeve Pullers & Installers **224–225**
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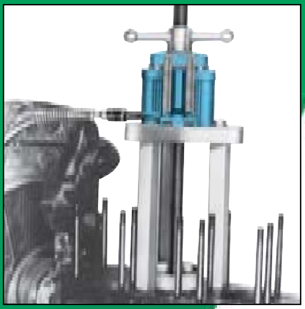
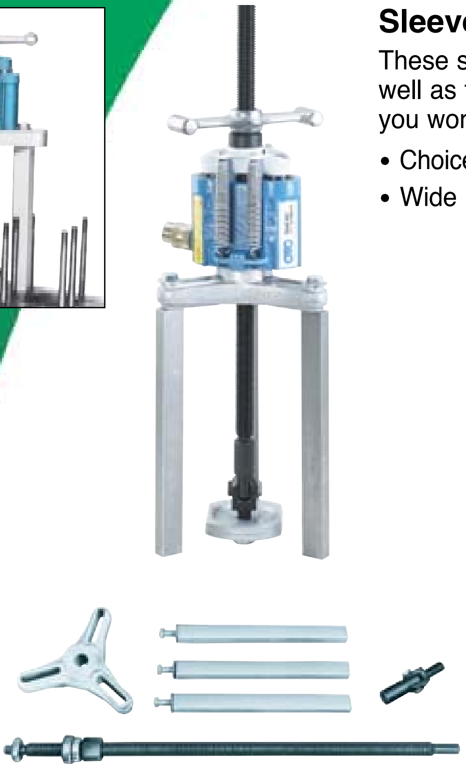
Heavy-Duty Class 4 – 8 Trucks

Category	Class	GVWR2	Representative Vehicles
Medium	4	62 - 71 kN (14,001 - 16,000 lbs.)	city cargo van, beverage delivery truck, wrecker, school bus
	5	71 - 87 kN (16,001 - 19,500 lbs.)	
	6	87 - 116 kN (19,501 - 26,000 lbs.)	
	7	116 - 147 kN (26,001 - 33,000 lbs.)	
Heavy	8	147 kN and over (33,00 lbs. and over)	truck tractor, concrete mixer, dump truck, fire truck, city transit bus





1200

Sleeve Puller / Installer Sets

These sets work on a wide array of truck, bus, and tractor engines, as well as those in other vehicles. They'll handle wet and dry sleeves – and you won't need to remove head studs. Save time, effort, and money.

- Choice of two sets: manual or 17-1/2 ton hydraulic powered.
- Wide range of adapter plates available to fit most engines.

Manual Sleeve Puller Set

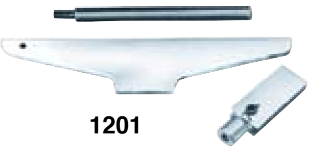
This manually operated, screw-powered device removes cylinder sleeves from most truck, bus, and tractor engines. Adapter plates (not included in the set) accommodate a wide range of bore sizes. See application chart on next page. The puller enables one technician to handle sleeve-pulling tasks.

Not recommended for Mack engines (use No. 1202 set).

No.	Description
24824	Thrust washer
37592	Three-way head
27908	13" risers (3 required)
22205	Forcing nut
208675	Swivel assembly
10088	Cap screws, hex hd. (3)
10586	Flat washers (3)
11466	Thrust bearing
32976	Pulling screw

No. 1200 – Manual sleeve puller set. Wt., 26 lbs.

4180



1201

Installing Conversion Kit for 1200 Set

Permits the No. 1200 sleeve puller to handle both removing and installing operations. Use plate Nos. 1253–1256 for installing, and plate Nos. 1219–1250 for removing. Plates are not included with kit.

No.	Description
33769	Screw extension
41291	Installing bar
302340	Yoke assembly

No. 1201 – Installing conversion kit. Includes screw ext., installing bar, and yoke assembly. Wt., 17 lbs., 13 oz.

SLEEVE PULLER PLATE APPLICATION CHART

The puller plates listed here work with manual and 17-1/2 ton hydraulic sleeve pullers	**Bore Dia.**	**Plate No.**
J.I. CASE – 207 Diesel	4"	**1227**
CATERPILLAR – 1673C; 1674; 3304; 3306; D330C; D333C; D334	4-3/4"	**1240**
D326, D337	5-1/8"	**1246**
CUMMINS – V Series 903 NT855	5-1/2"	**1250**
H & NH	4-7/8"	**1242**
GENERAL MOTORS – 53 Series	3-7/8	**1225**
71 Series	4-1/4"	**1232**
INT'L HARVESTER – C-221, C-263	3-9/16"	**1221**
D-166, D-188, D-236, D-282, C-248, D-248, D-310, D-358, D-155	3-11/16	**1222**
D-179, D-206, D-239	3-7/8	**1225**
C-281, D-281, D-361	4-1/8"	**1230**
D-691, D-461	4-3/4"	**1240**
D-407	4-5/16"	**1233**
JOHN DEERE – 4-270, 6-404	4-1/4"	**1232**
6-531	4-3/4"	**1240**
6-619	5.12"	**1246**
8-955	5.512"	**1250**
MACK – END(T) 673, 675, 676	4-7/8"	**1243**
672	4-7/8"	**1242**
END (T) 711, 707	5"	**1245**
PERKINS – AD3.152, AG3.152, AD4.203	3.6"	**1219**
AG4.212, A4.236, AG4.236, A6.354, A6.3541, ATC6.3541, AT6.354, AT6.3541	3-7/8"	**1223**

Universal puller for wet-type sleeves, see following page.

17-1/2 Ton Hydraulic Sleeve Puller Set

Removes and installs sleeves of many makes and models of trucks, buses, and tractors. See chart at left and on next page.

Contents of Set No. 1202:

No.	Description	No.	Description
37592	Three-way head	**27908**	13" risers (3 req'd)
33769	Screw extension	**41291**	Installing bar
302482	Speed nut	**10221**	Hex safety nut
302340	Yoke assembly	**208675**	Swivel assembly
10088	Cap screws, hex hd (3)	**10586**	Flat washers (3)
32976	Pulling screw	**21714**	Insert
4180	Hyd. ram/pump assy.		

No. 1202 – 17-1/2 ton hydraulic sleeve puller set. Wt., 86 lbs.

No. 1203 – Sleeve puller without hydraulic assembly. Wt., 45 lbs., 10 oz.

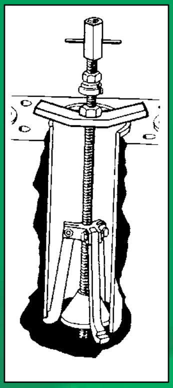
Universal Puller for Wet-Type Sleeves

This tool will remove cylinder sleeves faster than ordinary pullers because it requires very little setup time. Cone adjustment positions the puller jaws quickly, locking bar is tightened. To aid in breaking "frozen" sleeves loose, adjustable bridge is positioned on the cylinder block and the bearing-mounted forcing nut is tightened. Next, bridge is removed and slide hammer assembly is attached. With a few sharp hammer blows, sleeve is pulled. In most cases, job time will average less than two minutes per cylinder. The puller features a 5 lb. slide hammer to help bust loose even the most stubborn sleeves.

- Special adapters are unnecessary.
- Adjustable jaws fit sleeves 3" to 6-1/2" in diameter.

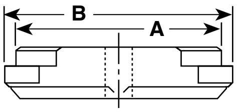
No. 1205 – Sleeve puller with 5 lb. slide hammer assembly. Wt., 20 lbs., 10 oz.

No. 1204 – Sleeve puller without 5 lb. slide-hammer assembly. Wt., 14 lbs.



Sleeve Removal Plates

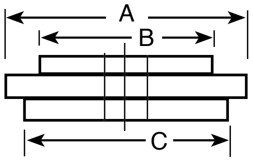
Designed to work with set Nos. 1200, 1202, and 1203, these removal plates fit the full spectrum of cylinder sleeve sizes. Determine engine bore size ("A" dimension) and O.D. of sleeve to be pulled ("B" dimension). Then consult chart to the right.

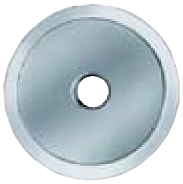


Bore Inches	"A" I.D. +.010 -.000	"B" O.D. +.015 -.015	OTC Plate Number
3.600"	3.585	3.657	**1219**
3-9/16"	3.547	3.663	**1221**
3-11/16"	3.671	3.792	**1222**
3-7/8"	3.840	4.047	**1223**
3-7/8"	3.859	4.093	**1225**
4"	3.984	4.218	**1227**
4-1/8"	4.109	4.229	**1230**
4-1/4"	4.235	4.470	**1232**
4-5/16	4.302	4.450	**1233**
4-3/4"	4.734	5.171	**1240**
4-7/8"	4.860	4.980	**1242**
4-7/8"	4.860	5.045	**1243**
5"	4.977	5.120	**1245**
5-1/8"	5.093	5.593	**1246**
5-1/2"	5.484	5.718	**1250**

Sleeve Installation Plates

Each of these dry-sleeve installation plates covers a range of bore sizes. Their reversible design makes both sides usable. The plates work with our manual or 17-1/2 ton hydraulic puller/installers (Nos. 1200, 1202, and 1203). Check chart at right to ensure correct sleeve selection.



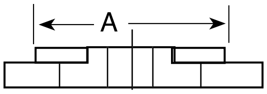


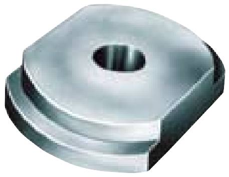
Fits Sleeves From	"A"	"B"	"C"	No.
3-3/16" to 3-7/16"	3-7/8"	3.171"	3.421"	**1252**
3-9/16" to 3-7/8"	4-1/4"	3.546"	3.859"	**1253**
4-1/8" to 4-3/8"	4-3/4"	4.109"	4.359"	**1254**
4-3/8" to 4-3/4"	5-1/4"	4.390"	4.734"	**1255**
4-13/16" to 5-3/4"	6-3/8"	4.797"	5.734"	**1256**

Blank Sleeve Remover Plates

These sleeve puller blanks supplement the sleeve puller plates listed above. Should a standard plate be unavailable, you can machine these blanks to the required bore size.

- Includes instructions.





Machined Bore Dim. "A"	Will Machine to Bore Size Dim. "A"	Blank Number
5.250	4.750	**39058**
4.750	4.400	**39057**
4.400	3.812	**38722**
3.812	3.437	**38724**
3.437	3.000	**38723**

Oil Seal and Wear Ring Installer

This two-piece tool makes the difficult job of correctly installing the rear crankshaft seal and wear ring on most Navistar DT-360 and DT-466 engines thru 1996 an easy task. Bolt the adapter to the crankshaft and wrench the component home.

- Eliminates damage to seals or wear ring that can occur when driving them into place.

No. 5022 – Oil seal and wear ring installer for 5.0" dia. seals (ZTSE4749 for 6.5" dia.). Wt., 32 lbs.

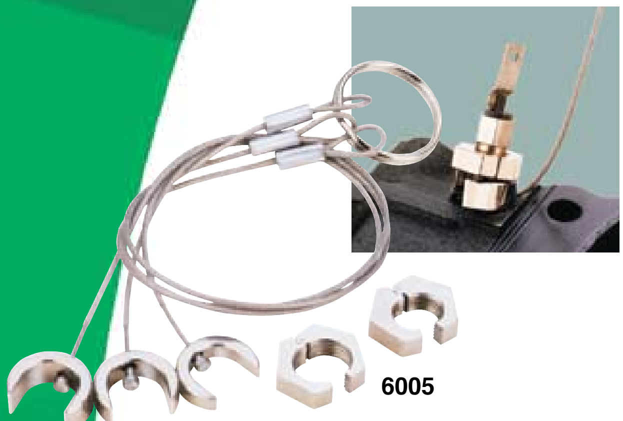
5022

7106

Cylinder Liner Height Gauge with Hold-Down Bar

This set lets you meet those exacting specifications necessary for optimum diesel engine performance. It accurately measures cylinder bore flatness and depth. The hold-down bar correctly seats the liner for accurate measurement of liner protrusion. The easy-to-read dial is in .001 inch graduations, 1.000" range.

No. 7106 – Cylinder liner height gauge with hold-down bar, in plastic case. Wt., 7 lbs., 7 oz.



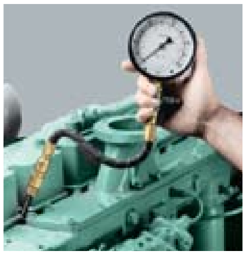
6005

Services Ford – 1983-87 6.9L, 1988-98 7.3L, GM – 1992-2000 6.5L, 1982-93 6.2L, 1980-85 5.7L, plus many import and ag. diesel engines

Diesel Glow Plug Removal Tool

- Removes damaged, stuck-in glow plugs on diesel engines without having to remove cylinder head, saving hours of service time!
- When glow plug tip is melted and plug cannot be removed without breaking it off, this tool is the only answer.
- Tool includes 10 mm and 12 mm split nuts that provide added threads for pulling. One of three furnished spacers is installed under split nut to give a solid base for extraction without breaking glow plug off. Split nut is held with a wrench as the glow plug is unscrewed from the head.
- Services diesels in popular 3/4- and 1-ton pickups. Comes in a plastic storage case.

No. 6005 – Includes 10 mm x 1.00 mm and 12 mm x 1.25 mm split nuts, three spacers (3/16", 1/4", 5/16"), plastic storage/organizer case, and instructions. Wt., 5 oz.



5020

Similar to Ford 303-D091 (D93T-6000-A)

5021

Similar to Ford No. 303-D092 (D93T-6000-B)

Diesel Compression Tester with Adapters

This easy-to-use compression tester is designed for light- and medium-duty diesel engines equipped with glow plugs. A dual-reading gauge, featuring a push-button release valve, measures compression to 1000 PSI and 7000 kPa. The hose end has quick disconnect fittings. The tester comes with glow plug and nozzle adapters in a handy storage case.

Tester services these engines:

- Cummins B and C
- Navistar DT466/DT360
- Ford/Navistar 6.9L & 7.3L
- Detroit 6.2L & 6.5L
- Hino diesel and Mitsubishi Fuso truck engines

No. 5020 – Diesel compression tester with adapters. Wt., 7 lbs., 13 oz.

No. 5021 – Universal diesel engine compression gauge. Wt., 1 lb., 8 oz.

No. 304802 – Replacement gauge. Wt., 8 oz.

Replacement Adapters (available separately)

No. 47484 – Hino diesel truck engines with 12 mm x 1.25 thread

No. 209633 – Ford 6.6L & 7.8L diesels

No. 217791 – Cummins B 3.9L 4 cyl. & 5.9L 6 cyl. '89-'98

No. 308472 – Mitsubishi Fuso truck 4D & 6D engines with 10 mm x 1.25 thread

No. 310810 – Cummins C 8.3L 6 cyl. '88-'96

No. 310832 – Ford/Navistar 6.9L & 7.3L, Detroit 6.2L & 6.5L with 10 mm x 1.0 thread

No. 310840 – Navistar DT466/DT360

Ford Diesel Compression Test Adapter

- Use with OTC No. 5021 diesel engine compression gauge.
- Remove glow plug; this adapter is used to connect the No. 5021 gauge to perform a compression test.
- Application: 1994–2003 Ford vans and pickups with 7.3L direct-injected turbocharged (DIT) diesel engine.

No. 6076 – Ford diesel compression test adapter. Wt., 5 oz.

Similar to
Ford 303-D103
(D94T-6600-E)

6076

Ford Diesel Compression Test Adapter

- Use with OTC No. 5021 diesel engine compression gauge.
- Works on 2003-2006 Ford vans and trucks—with 6.0L diesel engines.

6660 – Ford diesel compression test adapter. Wt., 7 oz.

Similar to
Ford 303-757

6660

Ford 5-pin Connector Harness for Glow Plug Testing

- Provides an easy way to check glow plug resistance without having to remove the valve cover of 1994-98 Ford trucks and vans with 7.3L DIT (direct-injected turbocharged) diesel engine.
- Use with any standard digital volt ohmmeter to check glow plug resistance.

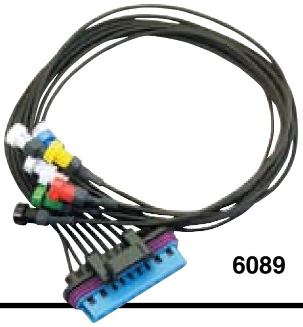
No. 6088 – Ford 5-pin connector harness for glow plug testing. Wt., 4 oz.

6088

Ford 9-pin Connector Harness for Glow Plug Testing

- Permits testing glow plug resistance without having to remove the valve cover of 1998-1/2–2003 Ford trucks and vans with 7.3L DIT (direct-injected turbocharged) diesel engines.
- Use with any standard digital volt ohmmeter to check glow plug resistance.

No. 6089 – Ford 9-pin connector harness for glow plug testing. Wt., 8 oz.



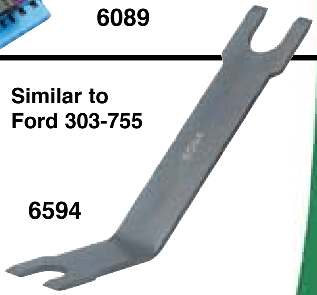
6089

Ford Oil Line Disconnect Tool

- Use to disconnect the high-pressure oil rail supply line from the fuel rail when removing fuel injectors.
- Works on the 6.0: diesel engine found in 2003–'07 F-250, F-350, F-450, and F-550 trucks, and Ford Excursions.

No. 6594 – Ford oil line disconnect tool. Wt., 5 oz.

Similar to
Ford 303-755



6594

High Pressure Oil Line Disconnect Tool

- Use to disconnect the high pressure oil line from the cylinder head.
- Works on 1998 - 2003 Ford vans and trucks with 7.3L direct-injected, turbo-charged (DIT) diesel engines.

No. 6595 – High pressure oil line disconnect tool. Wt., 3 oz.

Similar to Ford
303-625

6595

Ford Injector Remover/Installer Kit

- Removes and installs injectors without damaging the injector or cylinder head.
- Application: 1994–2003 Ford 3/4- and 1-ton trucks, Super Duty trucks, and vans with 7.3L direct-injected turbocharged (DIT) diesel engine.

No. 6067 – Ford injector remover/installer kit. Wt., 6 oz.

Similar to
Ford 303-491
and 303-492

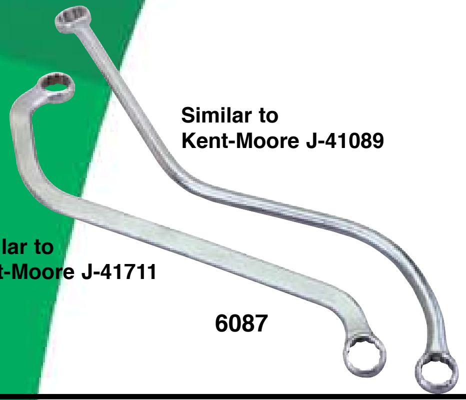
6067

6069
Similar to
Miller 8318

Cummins Diesel Fuel Injector Remover Kit

- Kit contains a fuel injector connector tube remover and fuel injector puller. The fuel injector connector tube must be removed before pulling the injector, or both will be damaged.
- Application: 1998-1/2–2002 Dodge pickups and vans with 5.9L 24-valve Cummins diesel turbo engine.

No. 6069 – Cummins diesel fuel injector remover kit. Wt., 8 oz.



GM Injection Pump Wrench Set

- Use to loosen or tighten injection pump retaining bolts whenever pump timing adjustment or pump service is required. Services 1996–2000 GM full-size 2- and 4-wheel drive trucks, vans, and Suburbans with 6.5L diesel engine.
- Two specially bent wrenches are needed, due to the location of the throttle, cruise control, T.V. cable bracket, cooling system crossover pipe and bracket, and the thermostat housing.
- Wrenches are 15 mm, 12-point, double box-end type.

No. 6087 – GM injection pump wrench set. Wt., 1 lb.

Detroit Diesel Injector Socket

Because of their location, some injectors are difficult to remove or install. But with this 30 mm socket, you'll be able to attach a 3/8" square-drive tool or 7/8" wrench. The socket fits injectors snugly to provide a good grip and avoid damage.

- Works on 6.2L and 6.5L engines.

No. 5060 – Detroit Diesel injector socket. Wt., 8 oz.

Master Cummins Diesel Fuel Injection Test Kit

- Includes the fittings and gauge needed to check fuel pressure, fuel volume, and fuel restrictions from the delivery pump to the injection pump.

Contents:
No. 518501 – Special quick-disconnect banjo fitting (M14 x 1.5 external).
No. 7915 – Two fuel injection quick-coupler adapters.
No. 7426 – Quick-disconnect banjo fitting (M12 x 1.5 external).
No. 223336 – Gauge assembly.
No. 6082 – Fuel volume test adapter.
No. 6078 – Diesel fuel inlet restriction test adapter.

- Application: 1988–98 Dodge pickups and vans with 5.9L 12-valve, & 1998-1/2–2003 5.9L 24-valve Cummins diesel engines.

No. 6080 – Master Cummins diesel fuel injection test kit. Wt., 5 lbs.

Cummins Diesel Fuel Volume Test Adapter

- Use to perform fuel volume test on fuel transfer pump. Fuel volume is as important as fuel pressure. Pump may pass pressure test, but fail volume test. Fitting is threaded into transfer pump, and No. 6082 is attached to the barbed end. The end of the 2 ft. tubing is placed into a container for fuel to be measured.
- Application: 1994–1998-1/2 Dodge pickups and vans with 5.9L 12-valve Cummins diesel engine.

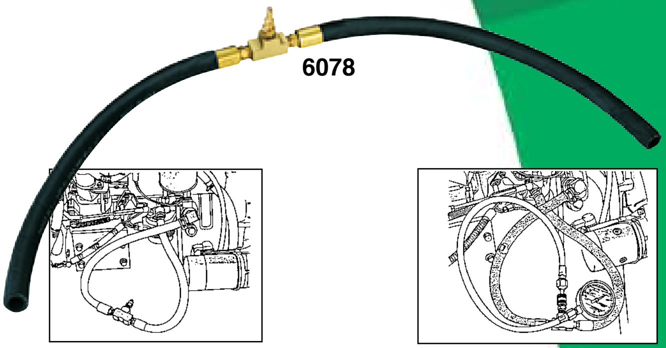
No. 6082 – Cummins diesel fuel volume test adapter. Wt., 3 oz.

6082

Cummins Diesel Fuel Inlet Restriction Test Adapter

- Adapter is used to perform a vacuum test on the transfer pump; excessive vacuum reading indicates a fuel inlet restriction.
- Application: 1988–95 Dodge trucks and vans with 5.9L 12-valve Cummins diesel engine. Included in OTC set No. 6080.

No. 6078 – Cummins diesel fuel inlet restriction test adapter. Wt., 1 lb., 3 oz.

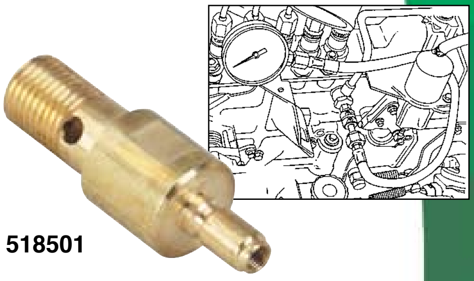


6078

Special Quick-Disconnect Banjo Fitting

- Adapter fitting (M14 x 1.5 male) is used to check fuel pressure from the delivery pump to the injection pump. Use with gauge assembly of OTC set No. 6079.
- Has quick-connect Schrader valve on end of fitting for safety and ease of hook-up to gauge. Included in OTC kit No. 6080.
- Application: 1996–1998-1/2 Dodge pickups and vans with 5.9L 12-valve Cummins engine.

No. 518501 – Special quick-disconnect banjo fitting. Wt., 3 oz.



518501

Cummins Engine Barring Tool

Need to manually rotate an engine? This tool makes the job easy. Just insert the tool into the flywheel housing until it engages the ring gear. Then attach a 1/2" square drive ratchet or breaker bar and turn. The tool's load-bearing collar provides friction-free operation while rotating the tool in the housing.

- Works on Cummins B and C series diesel engines and 5.9L diesels used in Dodge pickups.

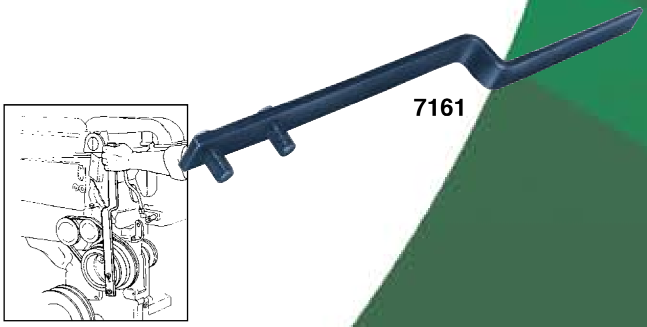
No. 7471A – Cummins engine barring tool. Wt., 11 oz.

7471A

Cummins Engine Turning Tool

This tool makes easy work of manually rotating a Cummins 855 cubic inch engine. It's essential hardware when you're bringing pistons to top dead center to adjust injector timing.

No. 7161 – Cummins engine turning tool. Wt., 4 lbs., 5 oz.



7161

Similar to
Kent-Moore J-29953-A

Compressor Drive-Gear Coupling Puller

Here's the solution for removing the coupling from the Cummins Compact and Bendix air compressors found on many Cummins 855 cubic inch engines. The split collet design fits over the coupling, and mechanical force does the work.

- Works on compressors with 1-3/4" O.D. shaft.

No. 7119 – Compressor drive-gear coupling puller. Wt., 2 lbs., 7 oz.

7120B
7120A

Cummins Drive-Pulley Tool Set

This two-piece set is designed to remove and install the drive pulley on Cummins NH and NTC 855 cubic inch engines. The 7120B remover simply bolts into the tapped holes for pulling. The 7120A installer threads onto the pulley accessory drive shaft for easy installation.

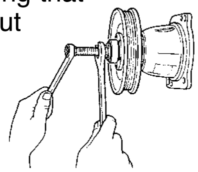
No. 7120 – Cummins drive-pulley tool set. Wt., 5 lbs., 5 oz.

No. 7120A – Drive-pulley installer. Wt., 2 lbs., 3 oz.

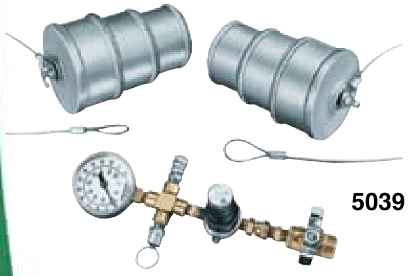
No. 7120B – Drive-pulley remover. Wt., 3 lbs.

Cummins Water Pump Pulley Tool

This heavy-duty tool is designed to remove or install water pump pulleys on Cummins L10 and M11 engines, 1991 and newer. The installer has a rugged thrust bearing that allows for friction-free pulley installation without damaging pump components.



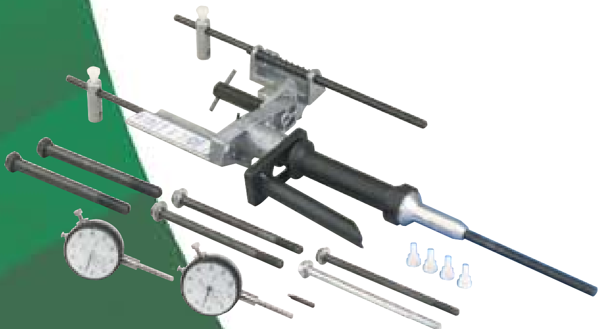
No. 5071 – Cummins water pump pulley tool. Wt., 2 lbs., 4 oz.



Charged Air Cooler Tester

This is the easy way to find air leaks in the charged air cooler systems used on class 7 & 8 truck engines. The tester features a large 2-1/2", 0-60 PSI pressure gauge, regulator and relief valve, and two safety cables. It also has quick disconnect air fittings that attach to a 3", 3-1/2", or 4" cooler hose.

No. 5039 – Charged air cooler tester. Wt., 7 lbs., 6 oz.



Cummins Diesel Injector Timing Kit

Measures static timing on Cummins J, K, N, NH, V-12, N-14, and L-10 series diesel engines. With this tool you can determine the injector push tube travel in relation to piston travel. Tool is installed with one dial indicator in the injector bore and the other on the injector push tube. Turn the engine over manually to find top dead center. By checking the gauges, you can determine if timing is within factory specifications, then make adjustments to the cam followers.

No. 7470 – Cummins diesel injector timing kit. Wt., 15 lbs.

Truck Clutch Alignment Shafts

These 10-spline clutch alignment shafts are available in the three most popular sizes: 1-1/2", 1-3/4", 2" O.D., and are designed for use on heavy-duty single, two-plate, push/pull, manual, and self-adjust clutches. The shafts are constructed of lightweight fiberglass-reinforced nylon that won't hang up in clutch disc splines. Yet, they're rugged and will easily support the weight of heavy pressure plates.

No. 5070 – Truck clutch alignment shaft. 1-1/2" O.D., 30 mm pilot. Wt., 10 oz.

No. 7072A – Truck clutch alignment shaft. 1-1/2" O.D., 1" pilot, 10 splines, 3.25" long. Similar to Ford 308-D001 (D79T-7550-A). Wt., 10 oz.

No. 7073A – Truck clutch alignment shaft. 1-3/4" O.D., 1-1/4" pilot, spline 3.75" long. Similar to Ford 308-D002 (D79T-7550-B.) Wt., 11 oz.

No. 7074A – Truck clutch alignment shaft. 2" O.D., 1-1/4" pilot. 10 splines, 3.6" long. Similar to Ford 308-D003 (D79T-7550-C). Wt., 13 oz.

No. 7480 – Truck clutch alignment shaft. 1-3/4" O.D., 1" pilot. Similar to Ford 308-D010 (D93T-7550-A). Wt., 7 oz.

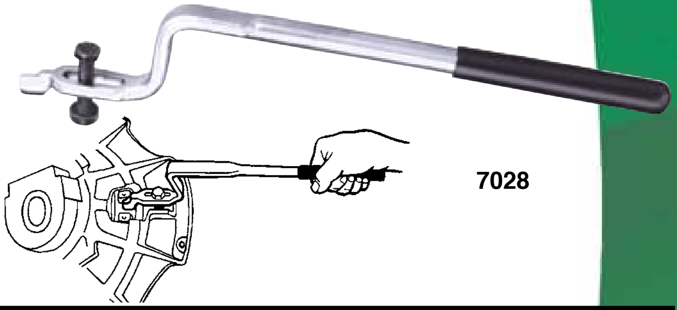
No. 5029 – Clutch alignment shaft. 2" O.D., 1-1/4" pilot. 10 splines, 7.3" long. Similar to Ford 308-D011 (D93T-7550-B). Wt., 1 lb.

No. 5030 – Clutch alignment shaft. 1-3/4" O.D., 1-1/4" pilot, spline 7.375" long. Similar to Ford 308-D012 (D93T-7550-C). Wt., 13 oz.

Clutch-Adjusting Wrench

This clutch-adjusting wrench will solve the difficult, time-consuming job of internally adjusting heavy-duty Spicer clutches. Using this wrench is much quicker and easier than makeshift methods such as pry bars, which often result in component damage, poor job performance, or extra downtime.

No. 7028 – Clutch-adjusting wrench. Wt., 1 lb., 8 oz.



Self-Adjusting Clutch Rotating Tool

This handy tool replaces the self-adjuster mechanism on Spicer self-adjusting clutches, allowing you to manually adjust them with a wrench or socket.

- 3/4" hex drive.

No. 5044 – Self-adjusting clutch rotating tool. Wt., 7 oz.

5044

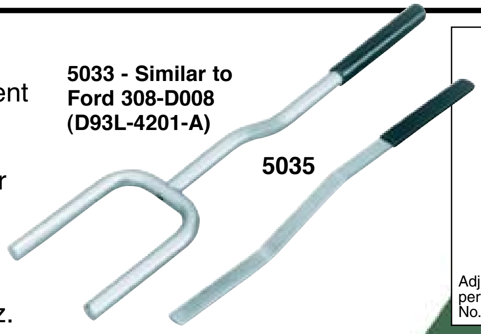
Truck Clutch Adjustment Set

The gauges in this set enable you to check the adjustment of pull-type, heavy-duty clutches, ensuring their correct operation. One gauge checks the amount of free play between the yoke and the bearing's wear pad. The other gauge lets you determine the amount of travel between the release bearing and transmission bearing cap.

No. 5035 – Truck clutch adjustment set. Wt., 1 lb., 8 oz.

No. 5034 – Clutch pedal free play gauge. Wt., 1 lb., 4 oz.

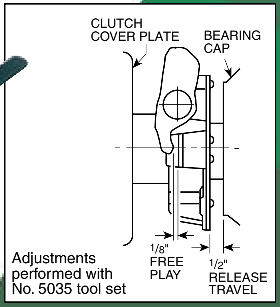
No. 5033 – Release bearing travel gauge. Wt., 4 oz.



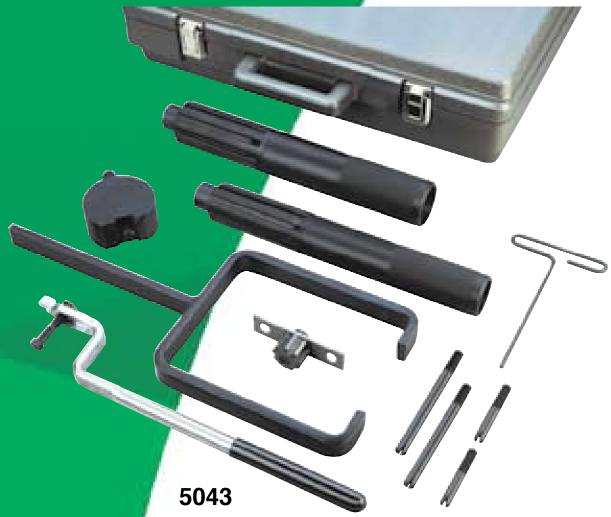
5033 - Similar to Ford 308-D008 (D93L-4201-A)

5035

5034 - Similar to Ford 308-D009 (D93L-7025-A)



Adjustments performed with No. 5035 tool set



5043

Clutch Service Set

Here's an ideal companion set to the No. 5015 clutch handler. Designed for Spicer heavy-duty clutches, the nine tools in this set help with a variety of jobs, from clutch installation and removal to flywheel drive-pin installation to clutch adjustment.

- Includes handy plastic carrying case.

No. 5043 – Clutch service set.
Wt., 15 lbs., 13 oz.

OTC No.	Description
5044*	Self-adjust clutch rotating tool. Rotates adjusting ring.
5045*	Flywheel drive pin installing tool. Aligns and installs drive pins in 14" heavy-duty truck pot-type flywheels.
5046*	Clutch release tool. Removes shipping blocks from between clutch housing and release bearing.
7028*	Adjusting wrench. For internal adjustment of multiple lever and angle-spring clutches.
7073A*	Clutch alignment tool. 1-3/4" O.D. Provides perfect fit to spline of clutch disc.
7074A*	Clutch alignment tool. 2" O.D. Provides perfect fit to spline of clutch disc.
213013	Pair of 3/8" flywheel to clutch guide pins.
213014	Pair of 7/16" flywheel to clutch guide pins.
213015	Hex key wrench. Removes/installs flywheel drive pin set screws.

* Tool is available separately.

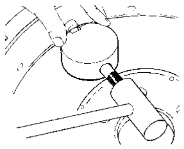
5046

Clutch Release Tool

- Permits removal of the shipping blocks from new clutch assemblies.

No. 5046 – Clutch release tool. Wt., 3 lbs., 10 oz.

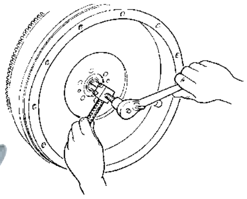
5045



Drive Pin Installing Tool

- Enables precise alignment and installation of the spacer plate drive pins on a pot-type 14" flywheel.
- Ensures free action of clutch assembly.

No. 5045 – Drive pin installing tool. Wt., 3 lbs.



Pilot Bearing Pullers

These tools make quick work of pulling stubborn, rusted pilot bearings. No. 5048 fits 1-1/4" I.D. bearings, and No. 5049 fits 1" I.D. bearings. The puller's forcing screw expands the jaws inside the bearing and simultaneously pushes against the crankshaft.

No. 5048 – Pilot bearing puller for 1-1/4" I.D.
Wt., 1 lb., 3 oz.

No. 5049 – Pilot bearing puller for 1" I.D.
Wt., 1 lb., 3 oz.

7071

Differential Housing Spreader

Removing and installing differential ring gear assemblies is typically a difficult, time-consuming chore – that is, unless you're using this differential housing spreader. This device uses mechanical screw power to spread the housing, allowing easy removal of the differential assembly while eliminating damage often caused by makeshift methods.

- Works on Dana axle models 30 through 70.

No. 7071 – Differential housing spreader.
Wt., 34 lbs.

U-Joint Puller

This service tool easily removes stubborn, corroded bearings without damaging U-joint components, even in limited space. The tool applies up to 7 tons of force to separate yoke assemblies and remove bearings. Far superior to sledgehammer methods.

- Works on Meritor 16N, 17N, 18N, and 1710 series U-joints and Spicer 1600/1610 to 1880 series U-joints.
- Includes plastic storage box, No. 1036 2-jaw puller, and instructions.

No. 7057 – U-joint puller. Wt., 16 lbs., 3 oz.

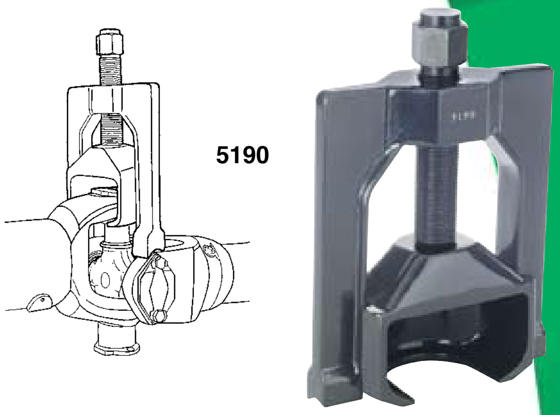
7057

Heavy-Duty U-Joint Puller

The ideal tool for disassembling drivelines.

- May be used with up to a one-inch impact wrench.
- Quickly and easily removes sealed U-joint cups without the need for hammering or heat.
- Will not damage the driveshaft, yoke, bearing cups, or joints.
- Fits practically all Class 7 and 8 trucks, including:
  Spicer driveline 1610, 1710, 1760, 1810, 1880
  Spicer SPL 140, 170, and 250 "Life Series"
  Meritor (Rockwell) 16N, 17N, 18N, 1710
  Meritor RPL 20 and 25 "Permalube" Series

No. 5190 – Heavy-duty universal joint puller. Wt., 11.4 lbs.



5190

Heavy-Duty Bearing Cup Installer

Quickly and easily installs bearing cups on Dana/Spicer SPL "Life Series" quick-disconnect universal joints.

- Three individual adapters press bearings to the manufacturer's recommended depths.
- Adapters fit Spicer SPL 140, 170, and 250 series drivelines.

No. 5191 – Heavy-duty bearing cup installer. Wt., 18 lbs.

5191

Heavy-Duty Bearing Cup Installer

Quickly and easily installs bearing cups on bolt-retained universal joints. Fits series 1610 to 1880 and nearly all other heavy-duty truck and machine type u-joints with bolt-retained bearing cups.

- Automatically aligns bearing cups during installation.
- Eliminates the possibility of damage to the needle bearing.

No. 5192 – Heavy-duty bearing cup installer. Wt., 1 lb., 11 oz.

5192

U-Joint Tool

Designed for a 1/2" impact wrench, this U-joint tool removes even the most stubborn U-joints with ease. It's compact and easily set up, making it ideal for service calls. And it can be used at different angles and in tight places, eliminating those damaging makeshift methods. The puller's legs have holes for bolt storage.

- Bolts included: 5/16"-24 x 1-1/2", 3/8"-24 x 1-1/2", 7/16"-20 x 1-1/2", M8-1.25 mm x 35 mm.
- Works on most Dana Spicer and Meritor U-joints – **except** Spicer's Life series model SPL250X.

No. 7490 – U-joint tool. Wt., 10 lbs., 7 oz.

7490

HEAVY-DUTY TOOLS

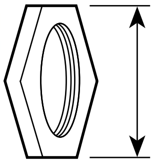
Truck Wheel Bearing Locknut Sockets

Wheel bearing locknuts are easy to remove or install with these specially designed sockets. They're made of high-strength steel and resist rounding out.

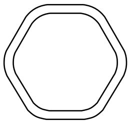
NOTE: Sockets are designed for use with 3/4" square-drive manual tools only. Impact tool use voids sockets' warranty.

1902 – Similar to Ford No. 205-039 (T70T-4252-B)
1904 – Similar to Ford No. 205-040 (T70T-4252-D)
1905 – Similar to Ford No. 205-041 (T70T-4252-E)
1910 – Similar to Ford No. 205-042 (T70T-4252-K)
1928 – Similar to Ford No. 205-043 (T70T-4252-W)

Measure from flat to flat to determine size of locknut, then consult chart to find the correct socket.



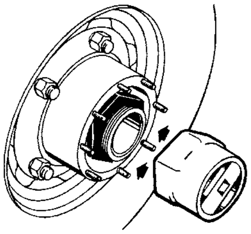
Measure from flat to flat to determine size of locknut, then consult chart to select a socket. **Warranty is void if tool is subjected to impact wrench use.**



* Fits special "rounded" hex nut found on Dana axles of some Ford trucks.

* Depth of locknut sockets is 5".

Socket No.	Opening Size	
1901	2-3/32"	(6 pt.)
1920	2-1/4"	(6 pt.)
1902	2-3/8"	(6 pt.)
1936*	2-3/8"	(6 pt.)
1903	2-3/8"	(8 pt.)
1921	2-1/2"	(6 pt.)
1904	2-9/16"	(6 pt.)
1905	2-9/16"	(8 pt.)
1928*	2-9/16"	(6 pt.)
1922	2-5/8"	(6 pt.)
1923	2-3/4"	(6 pt.)
1937	2-3/4"	(8 pt.)
1932	2-7/8"	(6 pt.)
1933	2-7/8"	(8 pt.)
1906	3"	(6 pt.)
1907	3"	(8 pt.)
1934	3-1/8"	(6 pt.)
1935	3-1/8"	(8 pt.)
1908	3-1/4"	(6 pt.)
1909	3-1/4"	(8 pt.)
1924	3-3/8"	(8 pt.)
1910	3-1/2"	(6 pt.)
1911	3-1/2"	(8 pt.)
1925	3-3/4"	(8 pt.)
1926	3-3/4"	(6 pt.)
1927	3-13/16"	(8 pt.)
1912	3-7/8"	(6 pt.)
1913	3-7/8"	(8 pt.)
1914	4"	(6 pt.)
1915	4-1/8"	(6 pt.)
1940	4-1/8"	(8 pt.)
1916	4-3/8"	(6 pt.)
1917	4-3/8"	(8 pt.)
1938	4-1/2"	(8 pt.)
1941	4-13/16"	(8 pt.)
1918	4-7/8"	(6 pt.)
1919	4-7/8"	(8 pt.)
1939	5-1/4"	(6 pt.)
7795	2-1/2"	(6 pt.)
7796	2-3/4"	(6 pt.)



Metric Truck Wheel Bearing Locknut Sockets

Socket No.	Opening Size	
1950M	54 mm	(6 pt.)
1951M	55 mm	(6 pt.)
1952M	60 mm	(6 pt.)
1953M	70 mm	(6 pt.)
1954M	71 mm	(6 pt.)
1955M	80 mm	(6 pt.)
1956M	82 mm	(8 pt.)
1957M	90 mm	(8 pt.)
1958M	94 mm	(8 pt.)
1962M	100 mm	(8 pt.)
1959M	106 mm	(8 pt.)
1960M	110 mm	(8 pt.)
1961M	120 mm	(8 pt.)

OTC
TRUCK WHEEL BEARING LOCKNUT WRENCHES 6 pt.

9850

Truck Wheel Bearing Locknut Sockets (6-pt.)

No. 9850 – 21 wheel bearing locknut sockets with tool board. Wt., 54 lbs., 7 oz.

No. 62908 – Display board only. Wt., 5 lbs., 7 oz.

No.	Qty.	Description
1901	1	Locknut socket (2-3/32")
1902	1	Locknut socket (2-3/8")
1904	1	Locknut socket (2-9/16")
1906	1	Locknut socket (3")
1908	1	Locknut socket (3-1/4")
1910	1	Locknut socket (3-1/2")
1912	1	Locknut socket (3-7/8")
1914	1	Locknut socket (4")
1915	1	Locknut socket (4-1/8")
1916	1	Locknut socket (4-3/8")
1918	1	Locknut socket (4-7/8")
1920	1	Locknut socket (2-1/4")
1921	1	Locknut socket (2-1/2")
1922	1	Locknut socket (2-5/8")
1923	1	Locknut socket (2-3/4")
1926	1	Locknut socket (3-3/4")
1928	1	Lknut. skt. (2-9/16" rounded)
1932	1	Locknut socket (2-7/8")
1934	1	Locknut socket (3-1/8")
1936	1	Lknut. skt. (2-3/8" rounded)
1939	1	Locknut socket (5-1/4")

Wheel Bearing Locknut Sockets (8 pt.)

No.	Qty.	Description	No.	Qty.	Description	No.	Qty.	Description
1903	1	Locknut socket (2-3/8")	**1917**	1	Locknut socket (4-3/8")	**1930**	1	Locknut socket (2-7/8")
1905	1	Locknut socket (2-9/16")	**1919**	1	Locknut socket (4-7/8")	**1931**	1	Locknut socket (3-5/8")
1907	1	Locknut socket (3")	**1924**	1	Locknut socket (3-3/8")	**1933**	1	Locknut socket (2-7/8")
1909	1	Locknut socket (3-1/4")	**1925**	1	Locknut socket (3-3/4")	**1935**	1	Locknut socket (3-1/8")
1911	1	Locknut socket (3-1/2")	**1927**	1	Locknut socket (3-13/16")	**1937**	1	Locknut socket (2-3/4")
1913	1	Locknut socket (3-7/8")	**1929**	1	Locknut socket (2-5/8")	**1938**	1	Locknut socket (4-1/2")

No. 9851 – 18 wheel bearing locknut sockets (8 pt.) with tool board. Wt., 53 lbs., 14 oz.

No. 62909 – Display board only. Wt., 6 lbs., 11 oz.

9851

Wheel Bearing Locknut Sockets

- A selection of popular sizes in 6- or 8-point.

No. 9852 – 12 wheel bearing locknut sockets and tool board. Wt., 34 lbs., 4 oz.

No. 62910 – Display board only. Wt., 5 lbs., 3 oz.

No.	Qty.	Description	No.	Qty.	Description
1904	1	Locknut skt. (2-9/16" hex)	**1921**	1	Locknut skt. (2-1/2" hex)
1908	1	Locknut skt. (3-1/4" hex)	**1922**	1	Locknut skt. (2-5/8" hex)
1909	1	Locknut skt. (3-1/4" 8 pt.)	**1923**	1	Locknut skt. (2-3/4" hex)
1910	1	Locknut skt. (3-1/2" hex)	**1928**	1	Locknut socket (2-9/16" hex rounded)
1913	1	Locknut skt. (3-7/8" 8 pt.)	**1932**	1	Locknut skt. (2-7/8" hex)
1914	1	Locknut socket (4" hex)			
1915	1	Locknut skt. (4-1/8" hex)			

9852

Tubular Spanner Wrenches

- Six-lug, spanner-type wrenches remove and install rear wheel bearing locknuts. They're built for use with a 3/4" square-drive ratchet or breaker bar.

No. 1929 – Wrench for servicing Chevrolet and GMC 5,200 and 7,200 lb. axles. Socket O.D. is 2-5/8". Wt., 1 lb., 11 oz.

No. 1930 – Wrench for servicing Chevrolet and GMC 11,000 to 13,500 lb. axles. Socket O.D. is 2-7/8". Wt., 2 lbs., 5 oz.

No. 1931 – Wrench for servicing Chevrolet and GMC 15,000 lb. axles; 17,000 lb. 2-spd. axles; 15,000 lb. trailing axles. Socket O.D. is 3-5/8". Wt., 3 lbs., 14 oz.

Budd Wheel Sockets

- Metric sizes for Isuzu, Hino, Mitsubishi Fuso, and import trucks; fit front and rear axle wheels.
- 1-1/2" hex Budd wheel socket for American-made trucks with dual rear wheels.

These sockets work on the import truck Budd wheels. Their extra deep design lets you remove both nut and stud with just the one socket. Usable with a 1" square drive impact wrench.

No. 1944 – Consists of 1945A, 1946A, 1947A, 1948A, and 1949A, in a blow molded organizer case.

No. 1945A – 35 mm hex socket with 17 mm sq. Wt., 2 lbs.

No. 1946A – 38 mm hex socket with 20 mm sq. Wt., 2 lbs., 8 oz.

No. 1947A – 41 mm hex socket with 21 mm sq. Wt., 2 lbs., 14 oz.

No. 1948A – 33 mm hex Budd wheel socket. For Mack Midliners, White Volvo, and other import trucks w/dual rear wheels. Wt., 1 lb., 8 oz.

No. 1949A – 1-1/2" hex Budd with 13/16" square wheel socket. For American-made trucks with dual rear wheels. Wt., 2 lbs., 8 oz.

No. 1944

OTC
TRUCK PINION
LOCKNUT SOCKETS

9814

Truck Pinion Sockets

We've designed and built these sockets to have the correct clearance for yoke and locknut assemblies on a variety of truck transmissions and differentials. The sockets have 3" of usable depth and are 4" long. Using the right tools saves time and effort, eliminating the need to destroy standard sockets by grinding them down to fit tight pinion clearances.

No. 9814 – Tool board and six sockets, 1975 thru 1980 listed above. Wt., 22 lbs., 6 oz.

No. 1981* – Socket only, not included in set. Wt., 3 lbs., 10 oz.

No. 62911 – Tool board only. Wt. 2 lbs.

Socket No.	Opening Size
1975	2" (6 pt.)
1976	2-1/8" (6 pt.)
1977	2-1/4" (6 pt.)
1978	2-3/8" (6 pt.)
1979	2-5/8" (6 pt.)
1980	2-3/4" (6 pt.)
1981*	2-1/2" (6 pt.)

NOTE: Use sockets with 3/4" square-drive, manually powered handles only. Warranty void if tool is subjected to impact wrench use.

"Major Persuader" Pry Bar Merchandiser

- Displays five of OTC's biggest pry bars on a bright, eye-level merchandiser.
- Display measures 16"w x 18"d x 64"h.
- Includes 5 pry bars: two 30", two 46", and one 54" in length.

No. 9901 – Heavy-duty pry bar merchandiser display. Wt., 40 lbs.

Major
PERSUADERS
for Heavy Duty jobs!
OTC
Major PERSUADERS

9901

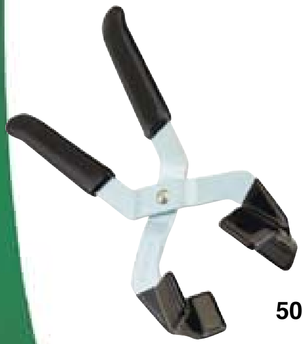
Bar No.	Qty.	Desc.
7168	2	30" jimmy bar
7420	2	46" jimmy bar
7421	1	54" jimmy bar

Lug Nut Cap Remover

Chrome-plated lug nut caps found on many heavy-duty trucks and trailers can be tough to remove, and they're easily damaged if you pry them off or use an ordinary cap remover. This tool avoids those problems. It is ruggedly built and features specially coated jaws that won't slip off the caps, no matter how much squeezing force you apply.

- Features cushioned handles.

No. 5047 – Lug nut cap remover. Wt., 13 oz.

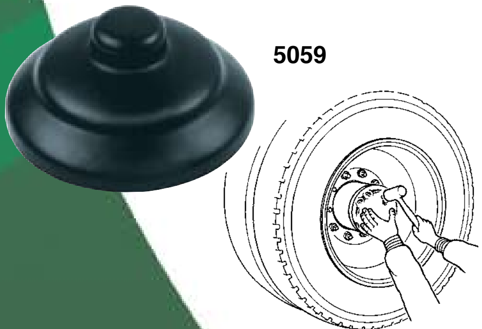


5047

Hubcap Installer

Truckers like chrome, and many of them accent their truck's drive axle with chrome hubcaps designed to snugly fit around the axle-shaft bolts. Unfortunately for service shops, these hubcaps are often tricky to install without causing damage. That's where our hubcap installer comes in handy. Constructed of high-density polyethylene, this tool guides the cap into place over the axle nuts, protecting it from unwanted and costly dents.

No. 5059 – Hubcap installer. Wt., 1 lb.

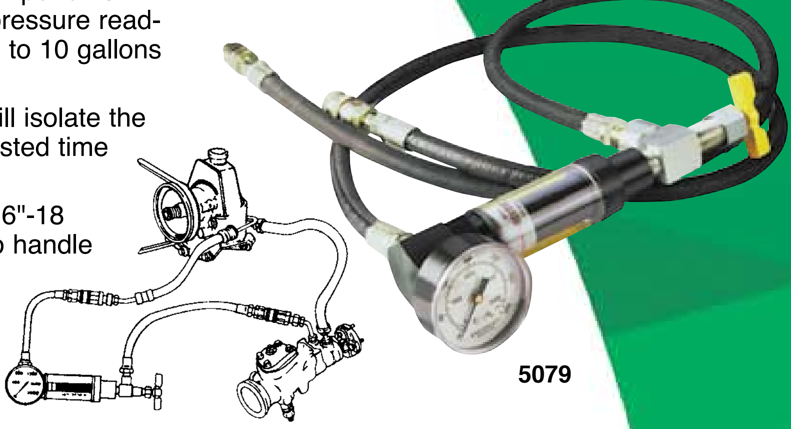


5059

Heavy-Duty Power Steering Pump Analyzer

- There is only one way to troubleshoot problem components in a heavy-duty power steering system: a flow and pressure reading meter. OTC's new No. 5079 measures both: 1 to 10 gallons oil flow and up to 3,000 psi of pressure.
- When connected in line, this universal analyzer will isolate the failed components in just minutes. There is no wasted time as in trial and error methods.
- The set is complete with high pressure hoses, 9/16"-18 standard fittings, and quick disconnect couplers to handle Eaton/Vickers, TRW, Ross, and Shepard power steering systems.

No. 5079 – Heavy-duty power steering pump analyzer. Wt., 6 lbs.



5079

Kingpin & Brake Anchor Pin Pusher

With this pin remover, hydraulic force and precision tooling replace torch-and-hammer methods for getting the job done quickly and easily. Five special collars and two pins allow this unit to work on both straight and tapered kingpins and accommodates sizes from 7/8" to 2" in diameter and up to 11-1/4" long. The tool delivers 30 tons of hydraulic force to push out even the most corroded kingpins. A job that could consume the better part of a day is done in minutes. The anchor pin can be removed quickly by using the special adapter installed in the pusher's base block and the unit positioned over the brake's spider.

- Works on many models of trucks and buses.
- 27-1/2" high x 8-1/2" wide.
- 30-ton capacity.
- Set includes No. 4002 hydraulic hand pump, No. 9767 hose, No. 9798 hose-half coupler, No. 4121 Power Twin 30-ton ram, and No. 29424 anchor pin adapter.

No. 4240 – Complete kingpin and anchor pin pusher set with hydraulics. Wt., 114 lbs.

No. 4241 – King- and anchor-pin pusher with anchor pin adapter without hydraulics. Wt., 59 lbs., 3 oz.

No. 29424 – Anchor pin adapter only. Wt., 1 lb., 12 oz.

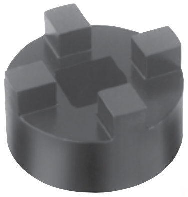
4240

Mack Kingpin Socket

Here is a socket that makes life a little easier for anyone who works on Mack trucks. Designed for 1/2" square drive ratchet or breaker bar, the socket fits the slotted adjusting screw in tapered kingpins used on most Mack front axles (12,000 to 20,000 lbs.).

No. 5053 – Mack kingpin socket. Wt., 13 oz.

Socket O.D. 1.8"



5053

Truck Tie Rod Socket

Designed to withstand the force of a 3/4" drive impact wrench, this rugged socket makes truck tie-rod end removal quick and simple.

- Works on inner and outer tie rod ends on 12,000 to 16,000 lb. truck axles.

No. 5068 – Truck tie rod socket. Wt., 3 lbs., 4 oz.

Socket I.D. 2-3/4"

5068

6065

Socket I.D. 2-1/8"

Tie Rod Socket for Medium-Duty Trucks

- Services GM-, Ford-, and Chrysler-built 1-ton 2WD and 4WD trucks.
- Also works on medium-duty Class 2 through Class 6 trucks.
- Use with a 1/2" drive impact wrench to easily remove the tie rod ends from the tie rod.

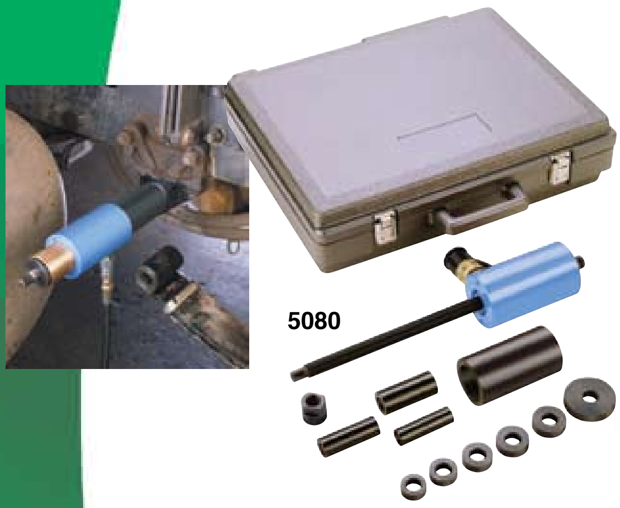
No. 6065 – Tie rod socket for medium-duty trucks.
Wt., 1 lb., 13 oz.

1767

Hendrickson Primaax Quick Alignment Socket

- Hendrickson – Approved tool.
- Used to adjust axle alignment on the Primaax air suspension.
- Works on Primaax models 230, 460, and 690 rear suspensions.

No. 1767 – Hendrickson Primaax quick alignment socket.
Wt., 3 lbs., 8 oz.

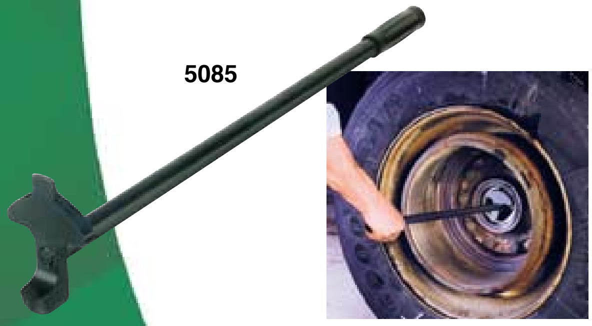


5080

Truck Front Leaf Spring, Pin, and Bushing Service Set

- Delivers 10 tons of hydraulic force to remove and install truck front spring eye bushing assemblies quickly and easily.
- Services bushings with diameters from 1-1/4" through 1-7/8", and pin diameters from 7/8" through 1-1/8". Handles all popular OE and aftermarket components, including Horton pin and bushing assemblies.
- Service bushing assemblies, in many cases, without removing leaf spring hangers and spring assemblies from the vehicle.
- All accessories are included except the hydraulic hand pump, which must be purchased separately.

No. 5080 – Truck front leaf spring, pin, & bushing service set.
Wt., 20 lbs. 8 oz.



5085

Hub Oil Seal Puller

- Eliminates bearing and hub damage that can occur when a punch and hammer is used to remove the seal.
- Extra long 28" handle provides leverage, unique pulling head design quickly and easily removes the seal in one piece.
- Built from the highest quality heat-treated steel.
- Removes hub seals on trailer and truck axles, including truck steering axles.

No. 5085 – Hub oil seal puller.
Wt., 6 lbs., 12 oz.

Universal Bearing Cup Installer

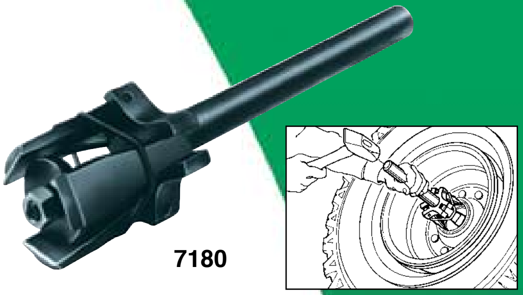
This handy, adjustable tool is designed to install wheel-bearing cups in a wide range of heavy-duty axles. Simply adjust and lock the jaws to the cup I.D., slip on the new cup, set it in the bore, and drive it in with a hammer. The tool helps eliminate the damage caused by makeshift methods.

- Works on axles from 11,000 to 50,000 lb. capacity.
- Adjusts to fit 3-5/8" to 6-1/2" O.D. bearing cups, which adds up to as many as 30 individual drivers.

No. 7180 – Universal bearing cup installer. Wt., 11 lbs.

No. 52038 – Replacement jaw.

No. 207561 – Replacement retaining spring.


7180

Slack Adjuster Pullers

These pullers will yank even the most corroded slack adjuster off the S-cam— and do so in just a fraction of the time needed with "heat and beat" methods. Plus, they won't damage components. Both pullers have a rugged forcing screw and cast steel body. Puller No. 5055 fits many manual types, and the No. 5056 works on Rockwell, Haldex, Gunite, and Bendix automatic adjusters.

No. 5055 – Manual slack adjuster puller. Wt., 5 lbs.

No. 5056 – Automatic slack adjuster puller. Wt., 6 lbs.

Air Brake Service Kit

This kit has the tools needed to remove slack adjusters and push-rod clevis pins used in the S-cam brake systems of class 7 and 8 vehicles.

- Works on manual or automatic slack adjusters.
- Includes Nos. 5055 and 5056 slack adjuster pullers, 5057 brake clevis pin press, and a plastic storage case.

No. 5054 – Air brake service kit. Wt., 14 lbs., 10 oz.

5054

Clevis Pin Press

Removing corroded clevis pins from a brake air-chamber pushrod can be a maddening and time-consuming task— unless you're using our clevis pin press. This handy screw-operated tool applies the force just where it's needed. The pin is easily removed from its hole without damaging nearby components.

No. 5057 – Clevis pin press. Wt., 1 lb., 13 oz.

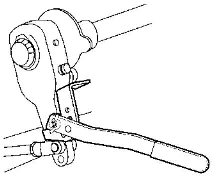
5057

Slack Check

This tool enables you to quickly check the brake adjustment on class 7 and 8 trucks and trailers having S-cam brakes. It features a sturdy, four-position handle to provide the leverage you need at the proper angle.

- Works on manual or automatic slack adjusters.

No. 5052 – Slack check. Wt., 1 lb., 3 oz.



5052

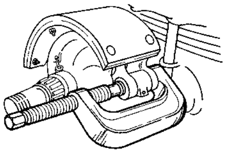
Heavy-Duty Anchor Pin Press

With this rugged C-frame press, you can easily remove stubborn and rusted brake anchor pins from spyders on heavy-duty vehicles. Mechanical screw power does the job quickly and efficiently.

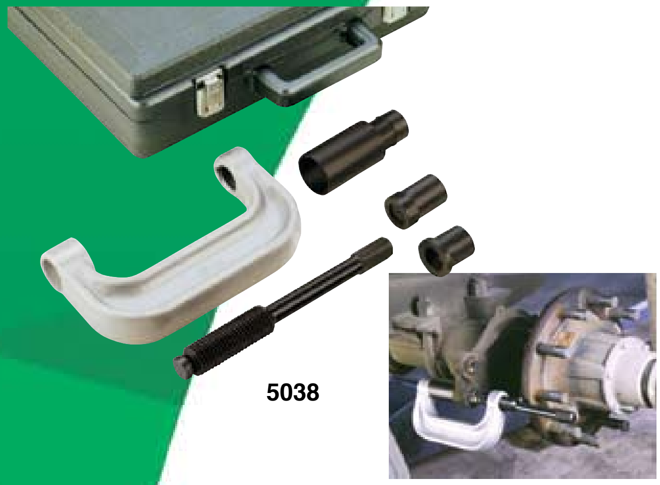
- Works on brake pins up to 1-1/4" in diameter.

No. 7248 – Heavy-duty anchor pin press. Wt., 9 lbs., 6 oz.

Similar to
Ford 205-026
(T74P-4635-C)



7248

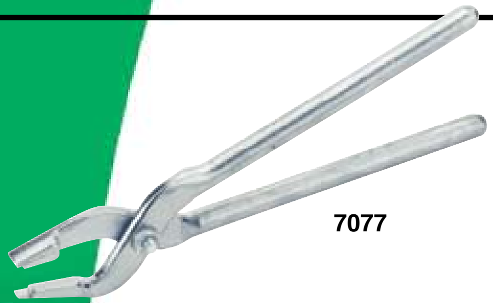


Brake Anchor Pin and Bushing Service Set

With the No. 5038, there's no need to remove the bearing hub assembly just to replace the pins and bushings on 16-1/2" S-cam trailer and tractor "Q" brake systems. Much less complicated and time consuming!

- Special tooling and our C-frame press get you past the hub assembly, so you can do the job quickly and professionally without damaging other parts.
- Includes everything needed for removal and replacement.
- Tooling is available separately for the tech who already owns the 7248 C-frame press.

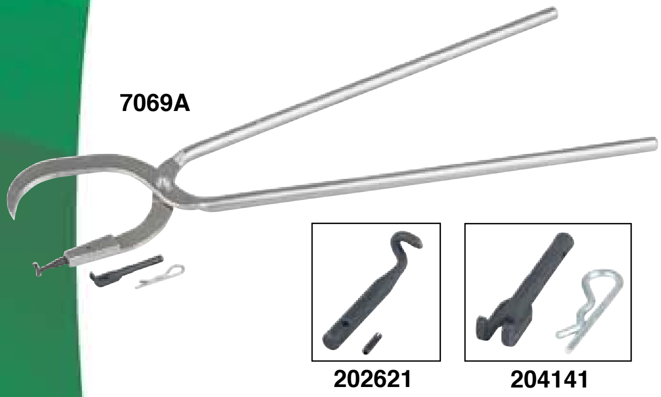
No. 5038 – Brake anchor pin and bushing service set includes C-frame press and tooling in a plastic storage case. Wt., 13 lbs., 9 oz.



Axle-Stud Cone Pliers

Now you can easily remove the tapered cone from studs used on the rear axles of medium and heavy-duty trucks. This specially designed tool gives you the leverage needed to expand the cone and remove it from the stud for axle removal.

No. 7077 – Axle stud cone pliers. Wt., 13 oz.



Heavy-Duty Brake Spring Pliers

Save time and effort when removing and installing return springs on the brake shoes of heavy-duty vehicles. This specially designed pliers works for hydraulic wedge-type and "S" cam air brakes. Its 26-1/4" length gives you the leverage to do the job more easily, and the huge jaw opening accommodates even the widest brake shoes.

No. 7069A – Heavy-duty brake spring pliers with "S" cam and wedge-type replaceable tips. Wt., 4 lbs., 8 oz.

No. 202621 – Wedge-type replacement tip. Wt., 2 oz.

No. 204141 – "S" cam replacement tip. Wt., 2 oz.

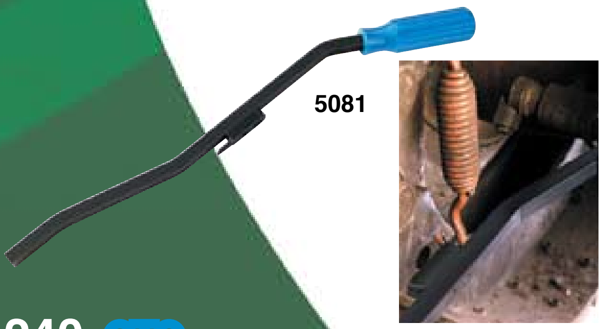
OTC Stinger
4592

Truck Brake Spring Pliers

- Designed to remove and install the brake shoe return springs on medium-duty and heavy-duty drum brakes.

No. 4592 – Truck Brake Spring Pliers. Wt., 2 lbs., 13 oz.

No. 4592-1 – Replacement tip.



S-Cam Air Brake Spring Tool

- Eliminate makeshift, unsafe methods of unhooking and reconnecting retaining springs when replacing brake shoes on heavy-duty tractors and trailers.
- Simply hook the retaining spring loop and press down. Lever action against the axle makes the job a snap!

No. 5081 – S cam air brake spring tool. Wt., 1 lb., 6-oz.

No. 314548 – Replacement hook kit. Wt., .5 lb.

Hydraulic Brake Spring Tool

Here's a tool to remove and install the return springs in Lucas Girling hydraulic brake systems. The tool's machined tip cradles the return spring securely, and its sliding fulcrum gives you all the leverage needed to do the job. A knurled handle helps prevent slipping.

- Works on 1984 to current Ford F600, F700, and F800 series having Lucas Girling hydraulic brakes.

No. 7462 – Hydraulic brake spring tool.
Wt., 10 oz.

7462

Lucas Rear Brake Adjusting Tool

If you're working on a lot of medium-duty hydraulic brake systems, you need our adjusting tool. It enables you to easily adjust Lucas Girling hydraulic brake systems (popular in Ford F700, F800, and F900 series). The tool's offset design and extra handle length get the job done quickly.

No. 5072 – Lucas rear brake adjusting tool.
Wt., 1 lb., 2 oz.

Similar to Ford
206-D005 (D90T-2588-A)

5072

Truck Transmission Bearing Service Set

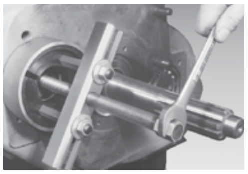
The set is designed to help you remove input shaft bearings and countershaft bearings, in both the main and auxiliary boxes of heavy-duty Fuller transmissions. It will also remove end yokes from 1600/1610–1810 series transmissions. The puller delivers 10 tons of mechanical power— essential force for working on big gearboxes.

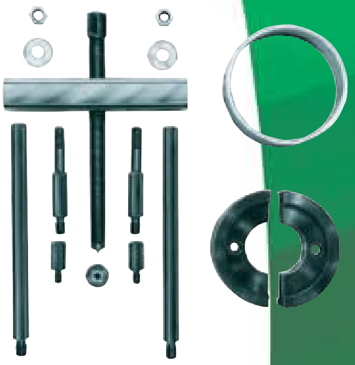
- Works on Fuller twin-countershaft transmissions: 125, 600, 660, 900, 9500, 1100, 12500, 12600, 13000, 14600, 15600, and 8600 series, 910–913, 915, and 9513.

No. 7070A – Truck transmission bearing service set.
Wt., 14 lbs., 3 oz.

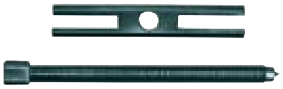
No. 7075 – Transmission output shaft end yoke remover only. Wt., 4 lbs., 3 oz.

No. 7207 – Collet only. Wt., 4 lbs., 13 oz.





7070A



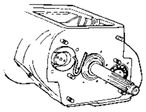
7075

Transmission Timing Block Sets

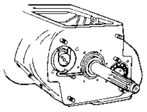
These sets enable one-man installation of front and rear countershaft bearings on Fuller twin-countershaft transmissions. The set positions the upper countershaft, yet lets you slide it aside to insert the main shaft. When the main shaft is in place and timing marks line up, turn the tool vertically to engage and position the countershaft to main shaft.

No. 7108 – Timing block set for Fuller RTO 610/613 transmissions. Wt., 1 lb., 2 oz.

No. 7109 – Timing block set for Fuller RT and RTO 910, 915, 9513, 12509, 12510, 12513, and 12515 transmissions. Wt., 1 lb., 12 oz.



Positioned for main shaft timing.



Positioned for bearing installation.

205776

Bearing Puller Set

This puller set, designed for use with our No. 7070A transmission service set (sold separately), is designed to remove front countershaft and input shaft bearings on Fuller RT, RTO 610/613 twin countershaft transmissions.

No. 205776 – Bearing puller set. Wt., 2 lbs., 10 oz.

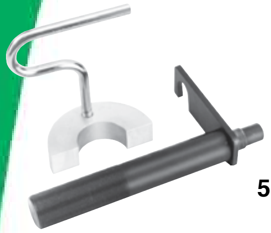
5051

Bearing Puller Set

When teamed with our No. 7070A puller, this puller set will remove front and rear countershaft bearings from the main case of Eaton® Fuller® 2 Series Roadranger® transmissions.

- Includes pulling collet, sleeve, and a pair of puller legs.

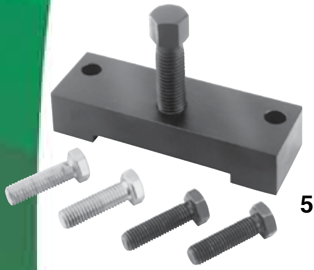
No. 5051 – Bearing puller set. Wt., 3 lbs., 12 oz.


5063

Timing Tool

- Designed to support the main-case upper countershaft during transmission assembly and timing.
- Works on Eaton® Fuller® 2 Series Roadranger® transmissions.

No. 5063 – Timing tool. Wt., 2 lbs., 5 oz.


5064

Countershaft Pushing Tool

Replacing rear countershaft bearing snap rings in Eaton Fuller transmissions? With this tool, you can easily move the countershaft rearward to expose the snap ring.

- Works on Eaton® Fuller® Roadranger® transmissions (series 2, 5, 6, and 7).

No. 5064 – Countershaft pushing tool. Wt., 4 lbs., 11 oz.

5065

Countershaft Bearing Driver

- Eases the task of installing a main-case countershaft bearing.
- Works on Eaton® Fuller® 2 Series Roadranger® transmissions.

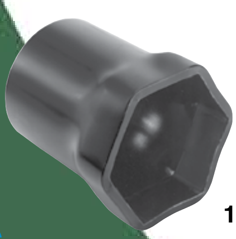
No. 5065 – Countershaft bearing driver. Wt., 3 lbs., 14 oz.

5066

Bearing Driver

This tool is designed to install the bearing on 2" diameter input shafts used in Eaton® Fuller® Roadranger® transmissions.

No. 5066 – Bearing driver. Wt., 5 lbs., 6 oz.


1982M

70 mm Hex Socket

Attach this heavy-duty socket to your 3/4" drive ratchet or breaker bar, and you'll be able to easily remove the end-yoke locknut on Eaton® Fuller® 2 Series Roadranger® transmissions.

No. 1982M – 70 mm hex socket. Wt., 3 lbs., 13 oz.

Auxiliary Countershaft Shim Tool

When you're working on Eaton® Fuller® 2 Series Roadranger® transmissions, this tool holds the auxiliary countershaft in place while you set the bearing end play.

- Includes a support strap for .100 and .125 shim settings, and metric and standard mounting bolts.

No. 5062 – Auxiliary countershaft shim tool.
Wt., 3 lbs., 13 oz.

5062

Cummins® Injector Puller

This helpful puller will handle a variety of injectors found in Cummins engines: mechanical L-10, PDT, and PTD top-stop 855NH. Its two-jaw design firmly grips the injector while it is being removed by the slide hammer.

- Includes storage case and special adapter for pulling STC injectors.

No. 5042 – Cummins injector puller.
Wt., 6 lbs.

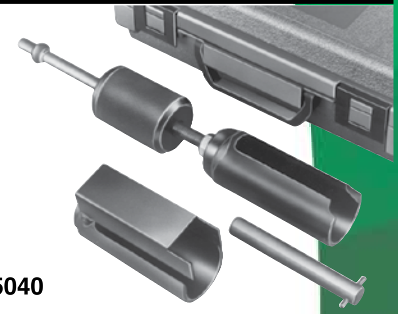
5042

Cummins® Injector Remover/ Installer

This is our best tool for removing or installing fuel injectors on Cummins L10 and N14 Celect electronically controlled engines. The large slide hammer and pin-type pulling adapter easily— and safely— handle injector jobs.

- Includes storage case.
- Two installing adapters help prevent damage to an injector's electronic solenoid.

No. 5040 – Cummins injector remover/installer.
Wt., 7 lbs., 1 oz.


5040

Cummins® Fuel Injector Puller Adapter

When combined with our No. 5028 injector puller or a slide hammer with a 1/2"–20 threaded shaft, this adapter gives you an easy, damage-free way to remove fuel injectors from Cummins B and C series engines.

No. 217793 – Cummins fuel injector puller adapter for B and C series engines with 12 mm x 1.5 injector threads. Wt., 5 oz.

No. 215844 – Cummins fuel injector puller adapter for B and C series engines with 14 mm x 1.5 injector threads. Wt., 5 oz.

217793

215844

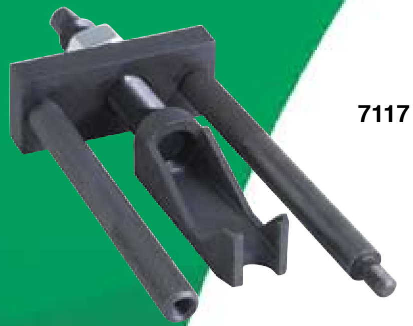
Mack Fuel Injector Nozzle Tool

Here's a handy tool for removing or installing injector nozzles on Mack E-6 4 VH and E-9 4 VH four-valve engines. The puller threads directly into the nozzle holder, and mechanical screw power does the pulling while a cylindrical guide holds the injector steady.

- Includes gauge to ensure correct injector depth during installation.

No. 7455 – Mack fuel injector nozzle tool.
Wt., 2 lbs., 2 oz.

7455

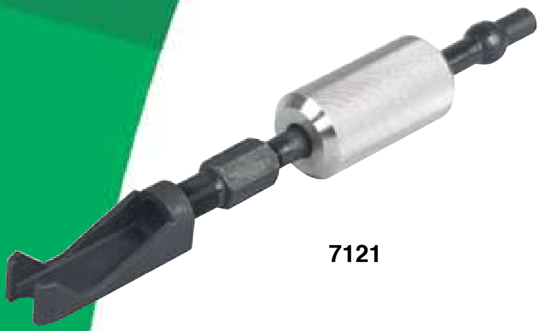

7117

Caterpillar Fuel Injector Nozzle Puller

We've designed this nozzle puller to remove pencil nozzles on Cat engines. The tool applies straight, even pulling power through a bridge assembly and mechanical forcing screw. The job is done quickly— and without damage.

- Works on Caterpillar 1100/3208 diesel engines.

No. 7117 – Caterpillar fuel injector nozzle puller.
Wt., 1 lb., 13 oz.

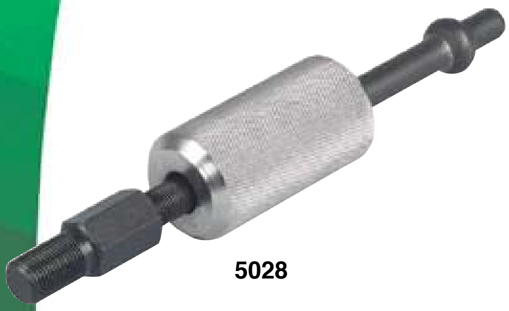

7121

Fuel Injector Nozzle Puller

We've designed this puller to remove the pencil-type fuel injector nozzles used in many agricultural and construction engines. The slide hammer action gives a straight, even pull without damaging components.

- Works on Case, Caterpillar, GM, John Deere, Waukesha, and White diesel engines.

No. 7121 – Fuel injector nozzle puller.
Wt., 2 lbs., 5 oz.

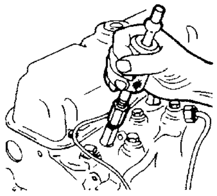

5028

Slide Hammer Puller

The No. 5028 slide hammer is just 8-1/2" long to fit into tight spots, but its 1-1/2 pound hammer gives you a little extra muscle for stubborn jobs. It's perfect for pulling injector nozzles. The shank is threaded 1/2" –20 and has a 5/8" –18 threaded adapter included. Works with many OTC pulling attachments.

No. 5028 – Slide hammer puller.
Wt., 2 lbs.

218163

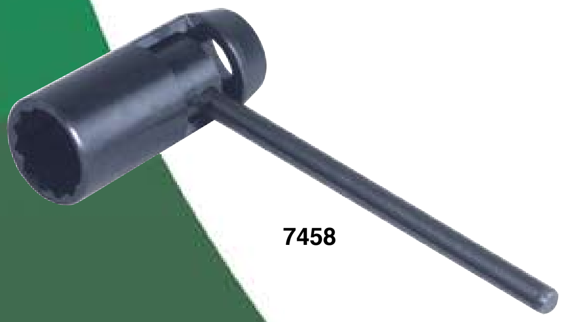


Ford Fuel Injector Puller Adapter

Designed to work with the No. 5028 slide-hammer puller, this adapter removes injectors from Ford 6.6L and 7.8L diesel engines without damage.

- Slide-hammer threads are 1/2" x 20. Threaded end for injector is 14 mm x 1.5.

No. 218163 – Ford fuel injector puller adapter.
Wt., 3 oz.


7458

Bosch Nozzle Socket

Here's a helpful multipurpose tool for removing or installing injector nozzles. You use the inner socket to hold the nozzle stationary, and the outer socket to loosen or tighten the nozzle's gland nut.

- Works on Bosch KDEL 21 mm injector nozzles used in John Deere engines.

No. 7458 – Bosch nozzle socket. Wt., 11 oz.

Fuel Injector Pump Rotating Tool

Maximum fuel economy requires precise injector timing. The tool securely grips the front of the fuel injection pump so you can rotate it while fine-tuning the system.

- Works on Stanadyne rotary fuel pumps found on International's 6.9 and 7.3 liter engines.

No. 7461 – Fuel injection pump rotating tool. Wt., 1 lb., 14 oz.

Similar to
Ford No. 303-228
(T83T-9000-C)

7461

Diesel Fuel Line Wrenches

Fuel line nuts are often hard to reach, but these unique 3/8" square-drive tools solve that problem. With them, you can loosen or tighten fuel lines at the fuel injector nozzle or fuel injection pump without damaging the nut.

No. 7453A – Fuel line wrench, 2.6" long. For International DT466 and 9L diesel engines. Fits 19 mm fuel line nuts. Wt., 4 oz.

No. 7460 – Fuel line wrench, 2.6" long. For International 6.9L and 7.3L diesel engines. Fits 5/8" hex nut. Wt., 5 oz.

Similar to
Ford No. 303-230
(T83T-9396-A)

Injector Seat Cleaner

Carbon buildup on an injector seat surface prevents proper seating of new injectors. With this tool, you'll be able to clear away carbon deposits and avoid seating problems.

- Works on 6.9L and 7.3L Ford/Navistar diesels.
- Thread size is 24 mm x 2-6g.

No. 5023 – Injector seat cleaner. Wt., 10 oz.

Similar to
Ford No. 303-232
(T83T-9527-A)

5023

Injector Sleeve Set

Here are the ideal tools for removing and installing the injector sleeves of International DT466 engines. The removing tool threads onto a slide hammer with 5/8" - 18 threads to remove sleeves quickly. The installer seats new sleeves equally fast, without damage.

No. 5024 – Injector sleeve set. Wt., 1 lb., 8 oz.

5024

Calibration Fluid

- For use in diesel injection pump testers and injector nozzle testers, such as our Nos. 4200 Nozlrater and No. 4210 Nozlrater II.
- 1 gallon

No. 208629 – Calibration fluid. Wt., 7 lbs.

NO. 208629
CALIBRATION FLUID

208629

4200

Specifications	
Overall width	5-3/4"
Overall length (includes handle)	26"
Overall height	11-1/4"
Weight (empty)	15 lbs., 10 oz.
Max. pressure	5000 PSI (350 bar)
Max. reservoir cap.	.692 gal. of diesel fuel (160 cu. in.)
Usable reservoir cap.	.628 gal. of diesel fuel (145 cu. in.)
Outlet port	For 3/8" tube
Gauge	Calibrated 0–5000 PSI (350 bar) Has 3-1/2" dial face with maximum reading indicator needle.
Gauge connection	1/4" NPT internal
Stroke of 1/2" dia. piston	3/4"
Volume per full stroke	.147 cu. in. (2.4 cc)
Intake filter	2 micron

Nozlrater Diesel Injector Nozzle Tester

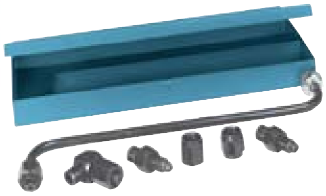
Here is the ultimate tool for diagnosing a number of problems that affect diesel fuel injector nozzles. The Nozlrater tester enables you to check for leakage, pop-off pressure, spray pattern, and chatter. This tool will accommodate a wide range of injectors. We also offer adapters so you can troubleshoot nozzles used in popular automotive, agricultural, and construction engines. Nozlrater features a rugged, lightweight reservoir that holds 7/10 of a gallon of fuel. It is equipped with a replaceable 2-micron filter. The large, dual-scale, high-pressure gauge is protected by a guard and includes an indicator needle to record maximum pressure reached. The tester is light enough to be easily carried for field use. Or you can bench-mount it, using the holes in its base.

- Not designed for Cummins or Detroit injectors.

No. 4200 – Nozlrater diesel injector nozzle tester. 5000 PSI maximum pressure capacity.
Wt., 15 lbs., 10 oz.

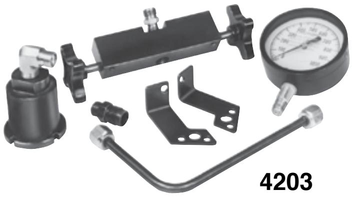
No. 17169 – Replacement filter.
Wt., 1 oz.

No. 11565 – Gauge.
Wt., 10 oz.



4202

No. 4203 optional adapters	
No.	**Description**
209197	Adapter to convert the 4203 for testing other high-pressure, pencil-type nozzles with adapters in the 4201 set.
207036	Straight adapter for pencil-type nozzles on 3300 and 3406-B.



4203

Nozzle Tester Manifold/Adapter Sets

These adapter sets expand our No. 4200 Nozlrater to troubleshoot a wide range of diesel engine injector nozzles.

No. 4202 – Adapters for servicing Audi, GM, Mercedes-Benz, Nissan/Datsun, Toyota, and VW Rabbit diesel engines.
Wt., 2 lbs., 14 oz.

No. 4203 – Manifold/adapter set. Tests Caterpillar high- and low-pressure, capsule-type nozzles, and high-pressure, pencil-type nozzles on 1100 and 3200 series engines. Complete with Nos. 39870 and 206168 adapters, low-pressure gauge (up to 1,000 PSI), cap plug and mounting brackets.
Wt., 6 lbs., 13 oz.

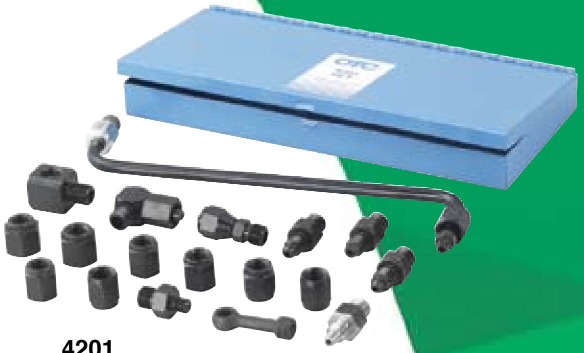
Adapter No.	No. 4202 set includes: Description	Chevy Chevette & GM 1980 & newer C.A.V. nozzles	GM 1979 & newer pencil nozzles	GM 1978 pencil nozzles	Nissan, Toyota, & VW Rabbit Diesels	Audi & Mercedes-Benz
36352	Fuel line assy., 9/16"-18 R.H. thd. with 24° on pipe.	•	•	•	•	•
23617	90° adapter, 9/16"-18 external R.H. thd. (Ermeto 24°) to 9/16"-18 internal R.H. thd. (Ermeto 24°).	•	•	•	•	•
23621	Straight adapter, 9/16"-18 external R.H. thd. (Ermeto 24°) to 1/2"-20 external L.H. thd. (60° seat).	•	•		•	•
23622	Adapter nut, 12 X 1.5 mm internal R.H. thd. to 1/2"-20 internal L.H. thd.	•			•	•
201917	Adapter nut, 9/16"-18 internal R.H. thd. to 1/2"-20 internal L.H. thd.		•	•		
23693	Straight adapter, 1/2"-20 external L.H. thd. (Ermeto 24° & 90° seat) to 9/16"-18 external R.H. thd. (Ermeto 24°).			•		

Nozzle-Tester Adapter Set

This is our universal adapter set for testing injection nozzles on the most popular automotive, agricultural, and construction diesel engines. The set has 17 adapters that connect to our No. 4200 Nozlrater testing unit.

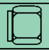
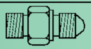
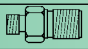
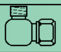
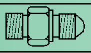
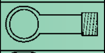
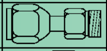
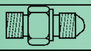
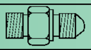
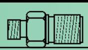
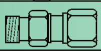
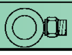
- Includes handy metal storage box.
- 23622— used on 1989–95 Cummins 5.9L, 1983–94 Ford 6.9L and 7.3L.
- 23623— used on 1996–2000 Cummins 5.9L and Navistar 6.6L and 7.8L

No. 4201 – Nozzle-tester adapter set.
Wt., 4 lbs., 2 oz.

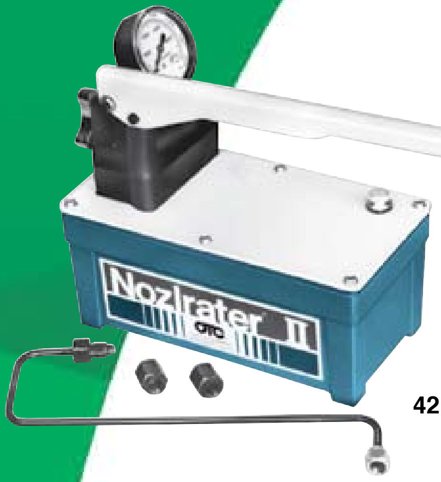


4201

No. 4201 Application Chart

Adapter No.		Description	I.H. Truck	I.H. Farm Construction	John Deere	Oliver & Allis	Waukesha	Case, Ford Tractor, Massey, & Perkins	White	Mack	Caterpillar Pencil Nozzles	Deutz	GM Autos	VW, Audi, & Mercedes Autos	Mercedes & Magaris Truck
36352		Fuel line assembly, 9/16"–18 R.H. thd. with 24° on pipe.	•	•	•	•	•	•	•	•	•	•	•	•	•
23622		Adapter nut, 12 X 1.5 mm internal R.H. thd. to 1/2"–20 internal L.H. thd.	•		•	•	•	•	•			•	•	•	
23623		Adapter nut, 14 X 1.5 mm internal R.H. thd. to 1/2"–20 internal L.H. thd.	•	•	•	•	•	•		•		•			•
23624		Adapter nut, 18 X 1.5 mm internal R.H. thd. to 1/2"–20 internal L.H. thd.		•		•	•	•							
201917		Adapter nut, 9/16"–18 internal R.H. thd. to 1/2"–20 internal L.H. thd.	•	•	•	•	•	•	•				•		
23626		Adapter nut, 5/8"–18 internal R.H. thd. to 1/2"–20 internal L.H. thd.	•	•		•	•	•							
201912		Adapter nut, 3/4"–16 internal R.H. thd. to 1/2"–20 internal L.H. thd.					•								
201913		Adapter nut, 9/16"–24 internal R.H. thd. to 1/2"–20 internal L.H. thd.	•	•											
23693		Straight adapter, 1/2"–20 external L.H. thd. (Ermeto 24° & 90° seat) to 9/16"–18 external R.H. thd. (Ermeto 24°).	•	•	•	•	•	•	•				•		
23692		Straight adapter, 3/8"–24 external R.H. thd. to 9/16"–18 external R.H. thd. (internal Ermeto 24°).	•	•											
23617		90° adapter, 9/16"–18 external R.H. thd. (Ermeto 24°) to 9/16"–18 internal R.H. thd. (Ermeto 24°).	•	•	•	•		•		•		•	•	•	•
23621		Straight adapter, 9/16"–18 external R.H. thd. (Ermeto 24°) to 1/2"–20 external L.H. thd. (60° seat).	•	•	•			•	•	•		•	•	•	•
208370		Banjo adapter, 9/16"–18 external R.H. thd. (24° seat).		•	•										
201916		Adapter, 9/16"–18 external R.H. thd. to 9/16"–18 internal R.H. thd. ferrule.			•										
208369		90° adapter, 9/16"–18 external R.H. thd. to 9/16"–18 internal R.H. thd.	•												
38279		Straight adapter, 14 X 1.5 mm external R.H. thd. (Ermeto 60°) to 9/16"–18 external R.H. thd. (internal Ermeto 24°).			•										
43468		Straight adapter, 1/2"–20 external R.H. thd. (Ermeto 24°) to 9/16"–18 external R.H. thd. (internal Ermeto 24°).							•						
Additional Accessories Available (not included in 4201 Set)															
44026		Straight adapter, 9/16"–18" R.H. thd. (Ermeto 24°) to Caterpillar 1100 & 3200 series pencil nozzle.									•				
201920		Adapter nut, 14 X 1.5 mm external thd. to o"–18 internal R.H. thread	Connects OTC 4200 Nozlrater to other fittings used in the industry.												
309277		Adapter nut, 14 X 1.5 mm internal thread	For use only on Mack 4-valve diesels. (E6 & E9)												

Nozlrater® II Injector Nozzle Tester



4210

The No. 4210 tests the small injector nozzles used in smaller car and light-truck engines. It enables you to diagnose leakage, pop-off pressure, spray pattern, and chatter. It has a .68-gallon reservoir and is equipped with a replaceable 2-micron filter. It delivers 1cc of fuel per stroke and won't flood small nozzles. The unit is light enough to be easily carried for field use, or you can bench-mount it.

- Includes fittings, fuel line, and 5,000 PSI (350 bar) gauge.
- Works on nozzles from Audi, GM, Mercedes-Benz, Nissan/Datsun, Toyota, and VW Rabbit diesels.

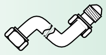
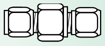
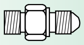
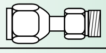
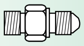
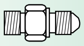
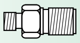
No. 4210 – Nozlrater II injector nozzle tester. Wt. 13 lbs., 15 oz.

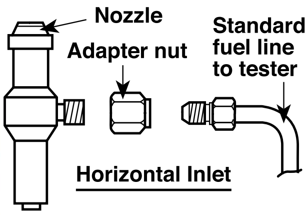
No. 17169 – Replacement filter. Wt., 1 oz.

No. 303292 – Gauge. Wt., 6 oz.

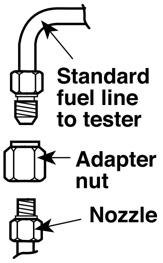
Specifications:	
Overall width	5-3/4"
Overall length (incl. handle)	15"
Overall height	10-3/4"
Weight (empty)	13 lbs., 15 oz.
Maximum pressure	5000 PSI (350 bar)
Max. reservoir capacity	.68 gal. (157 cu. in.)
Usable reservoir capacity	.58 gal. (134 cu. in.)
Outlet port	For 1/4" tube
Gauge	Dual calibrated, 0-5000 PSI, 0-350 bar, 1% accuracy, 2-1/2" dial with dual scale (PSI & bar).
Gauge connection	1/4" NPTF
Stroke of 1/2" dia. piston	5/8"
Volume per full stroke	1 cc
Intake filter	2 micron

Accessory Fittings (for use with, but not included with, No. 4210 Nozlrater® II)

No.		Description
303570		Fuel line used on nozzles with 90° horizontal inlets. 1/2"–20 internal R.H. thread to 1/2"–20 external L.H. thread (60° seat).
23624		Adapter nut, 18 X 1.5 mm internal R.H. thread to 1/2"–20 internal L.H. thread.
201917		Adapter nut, 9/16"–18 internal R.H. thread to 1/2"–20 L.H. internal thread.
23626		Adapter nut, 5/8"–18 internal R.H. thread to 1/2"-20 internal L.H. thread.
201912		Adapter R.H. thd. to 1/2"–20 internal L.H. thread.
201913		Adapter nut, 9/16"–24 internal R.H. thread to 1/2"–20 internal L.H. thread.
208384		Used to adapt standard fuel lines to the following adapters.
23693		Straight adapter, 1/2"–20 external L.H. thread (Ermeto 24° and 90° seat) to 9/16"–18 external R.H. thread (Ermeto 24°).
201916		Adapter, 9/16"–18" external R.H. thread to 9/16"–18 internal R.H. thread ferrule.
38279		Straight adapter, 14 X 1.5 mm external R.H. thread (external 60° seat) to 9/16"–18 external R.H. thread (internal Ermeto 24°).
43468		Straight adapter, 1/2"–20 external R.H. thread (Ermeto 24°) to 9/16"–18 external R.H. thread (internal Ermeto 24°).
44026		Straight adapter, 9/16"–18 external R.H. thread (Ermeto 24°) to Caterpillar 1100 & 3200 series pencil nozzle.



Horizontal Inlet



Vertical Inlet

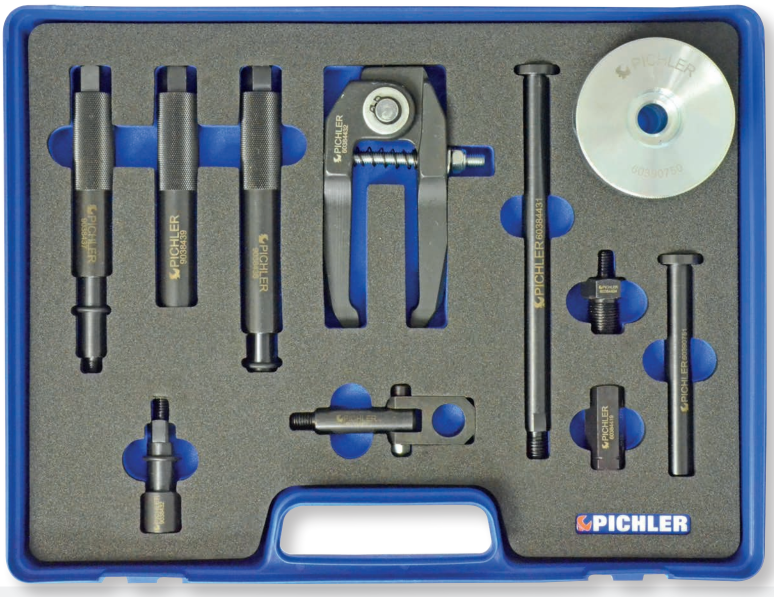
Adapter No.	Description	GM 1980 & Newer Poppet Nozzles	GM 6.2L Diesels	Chevy Chevette	Audi & Mercedes-Benz	Datsun, Toyota, & VW Rabbit	1989–95 5.9L Dodge (Cummins)	1996–2000 5.9L Dodge (Cummins)	1983–94 6.9L & 7.3L Ford (with Navistar)	6.6L & 7.8L Ford (with Navistar)
23622	Adapter nut, 12 X 1.5 mm female R.H. thd. to 1/2"–20 internal L.H. thd.	•		•	•	•	•		•	
23623	Adapter nut, 14 X 1.5 mm female R.H. thd. to 1/2"–20 internal L.H. thd.		•					•		•
201917	Adapter nut, 9/16"-18 internal R.H. thd. to 1/2"–20 internal L.H. thd.	GM 1979 & Newer Pencil Nozzles (not included with 4210)								

Manual

Universal Injector Removal Tool Kit

for Bosch, Siemens, Denso and Delphi CR injectors

60384435 / 60384535



SAFETY NOTICE

To understand the functioning of the tools, is it necessary to read the manual in advance!

- Read these instructions before assembling, during installation and throughout use and in the proper sequence.
- Always refer to the OEM manufacturer's instructions and service manuals for the latest data and to maintain the correct sequence.
- These work instructions and the recommended tools are meant to serve as aides only and are by no means a guarantee for certain results.
- This tool kit is a special collection and it has been tested and used successfully on several occasions. It is of the utmost importance to maintain the correct procedure as per the instructions.
- The use of the tools should only be carried out by qualified personnel!

Pictograms and their meaning:

⚠ **ATTENTION**
Special caution

💡 **LIGHT BULB**
Hint or recommendation

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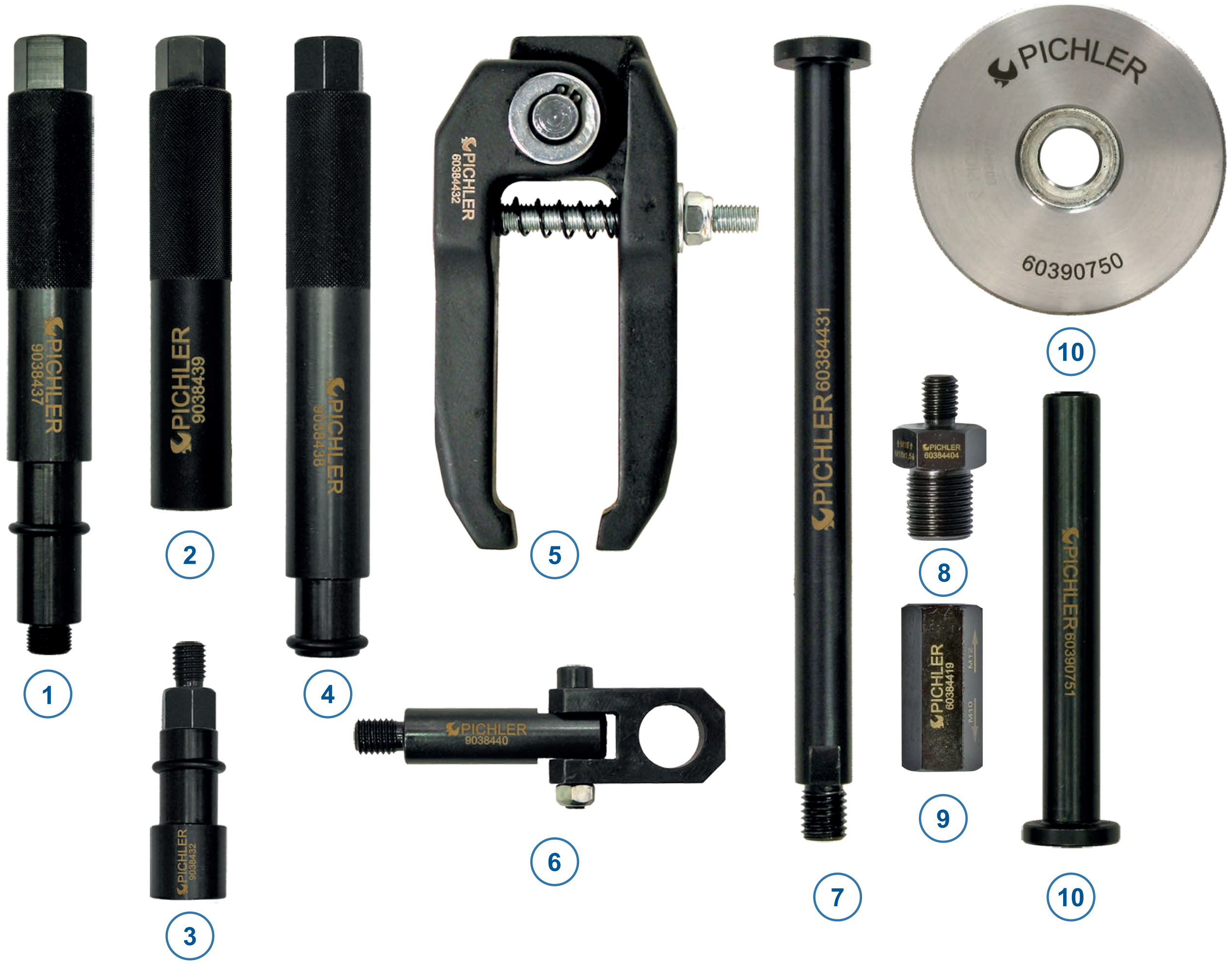
UNIVERSAL INJECTOR REMOVAL TOOL KIT

60384435 / 60384535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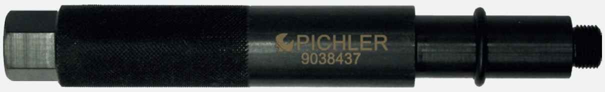
PICHLER 9038437
PICHLER 9038439
PICHLER 9038438
PICHLER 9038432
PICHLER 60384432
PICHLER 9038440
PICHLER 60384431
PICHLER 60384404
PICHLER 60384419
PICHLER 60390751
PICHLER
60390750

No.	Article no.	Description	60384435	60384535
1	**9038437**	Loosening Lever for Bosch/Siemens M12x1.0 external thread	1	1
2	**9038439**	Loosening Lever for Adapter 9039432	1	1
3	**9038432**	Adapter internal thread M14x1.5 : external thread M10 Delphi injectors	1	1
4	**9038438**	Loosening Lever for Denso M12x1.5 internal thread	1	1
5	**60384432**	Adjustable Claw	1	-
6	**9038440**	Swivel Joint	1	1
7	**60384431**	Slide Rod 205 mm	1	1
8	**60384404**	Adapter external thread M10 : external thread M18x1.5	1	1
9	**60384419**	Adapter internal thread M10 : internal thread M12	1	1
10	**60390750**	Slide Hammer with Slide Rod 115 mm	1	1

⚠ **Before starting work**

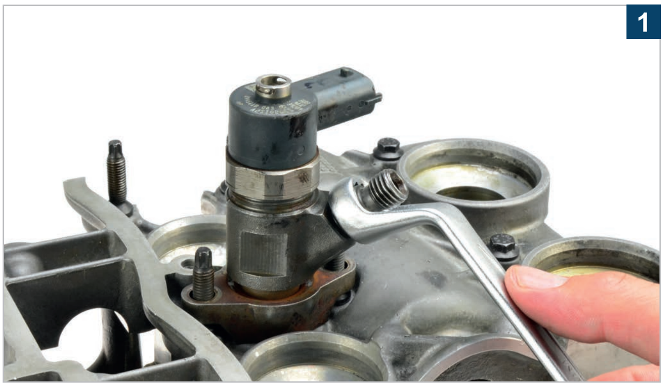
Remove in preparation all obstructing parts such as plastic covers, cable looms over the valve cover, injection lines, etc. and remove the retaining fork or the mounting of the injector.

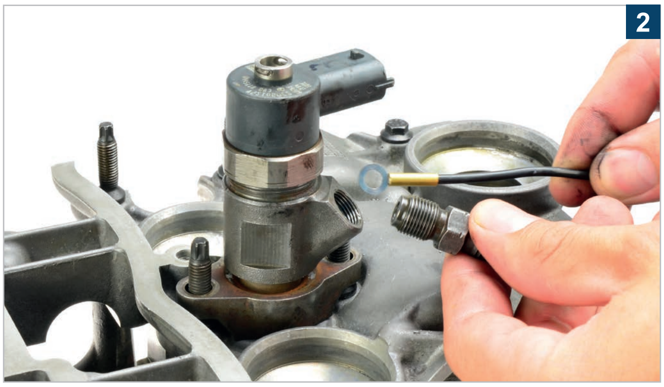
1. Bosch & Siemens injectors with removable connecter for the diesel injection line



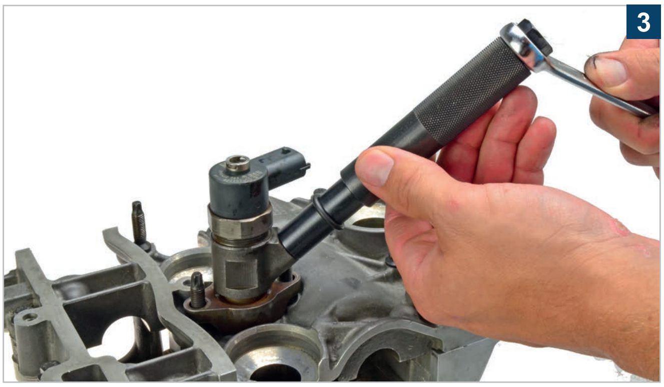
Loosening Lever with external thread M12x1 9038437 ①

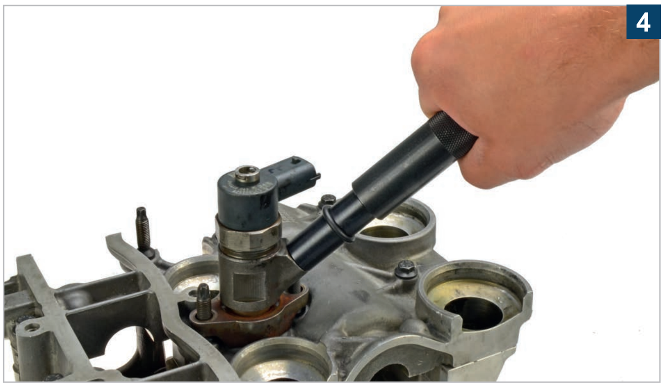
Unscrew the diesel line connector from the injector (hex 13mm) and remove the sealing ring from behind the connector with a magnet.





Screw the ***Loosening Lever with external thread M12x1 9038437*** ① in the thread for the connector for the diesel injection line and tighten it with a spanner 17. Try by juddering and levering to release and remove the injector.





If the injector can not be released, proceed to step 4 on page 6.

2. Denso injectors with fixed connecter for the diesel injection line M12x1.5

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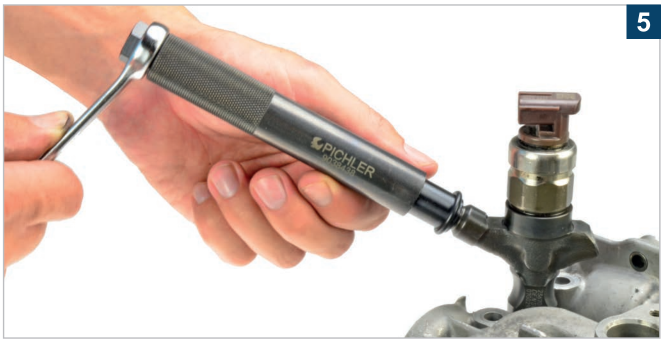
9038438

Loosening Lever with internal thread M12x1.5 9038438 ④

Screw the ***Loosening Lever 9038438*** ④ on the thread for the diesel injection line and tighten it with a spanner 17. Try by juddering and levering to release and remove the injector.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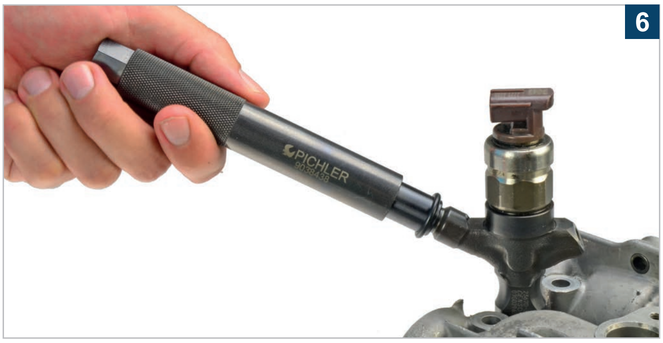
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If the injector can not be released, proceed to step 4 on page 6.

3. Denso Denso injectors with fixed connecter for the diesel injection line M14x1.5

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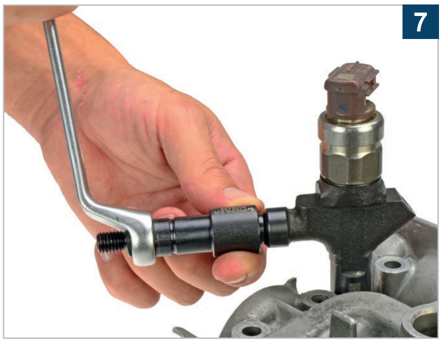
9038432
+
PICHLER
9038439

Adapter 9038432 ③ with ***Loosening Lever 9038439*** ②

Screw the ***Adapter 9038432*** ③ on the diesel line connector of the injector and tighten it with a spanner 13. Screw the ***Loosening Lever 9038439*** ② on the Adapter and tighten it with a spanner 17. Try by juddering and levering to release and remove the injector.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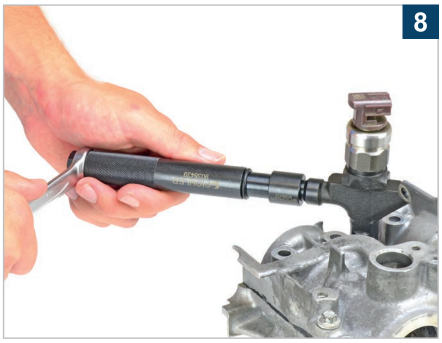
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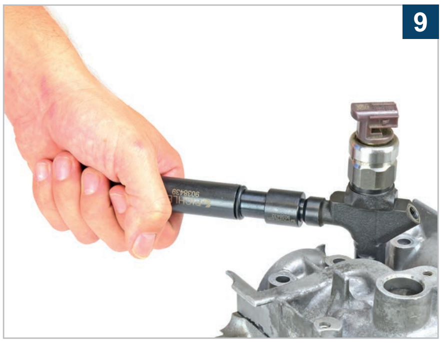
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If the injector can not be released, proceed to step 4 on page 6.

4. Pulling process using the Swivel Joint and Slide Hammer

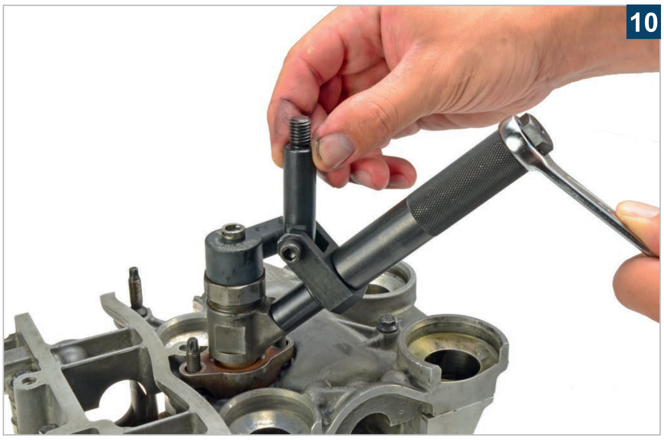
Swivel Joint 9038440 ⑥
with ***Slide Hammer 60390750*** ⑩

Should the pulling with the Loosening Levers not succeed, is it possible to pull the injector by creating an impact force with the Swivel Joint and Slide Hammer.

Remove the o-ring from the Loosening Lever and slide the ***Swivel Joint 9038440*** ⑥ on the Loosening Lever and fix it with the o-ring. Screw the Loosening Lever on or in the injector and tighten it with a spanner 17.

Screw the ***Slide Hammer 60390750*** ⑩ with Slide Rod (115 mm) or ***Slide Hammer 1030210*** (not included in the kit) on the Swivel Joint. Pull by simultaneously juddering the Loosening Lever and hitting with the Slide Hammer the injector out of the shaft.

Application example using the Loosening Lever *9038437* ①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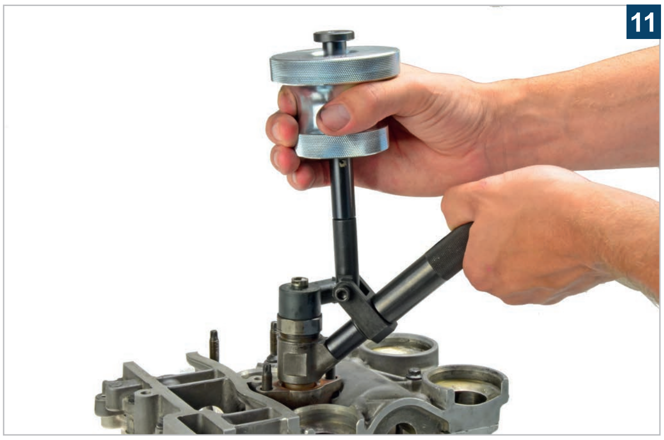
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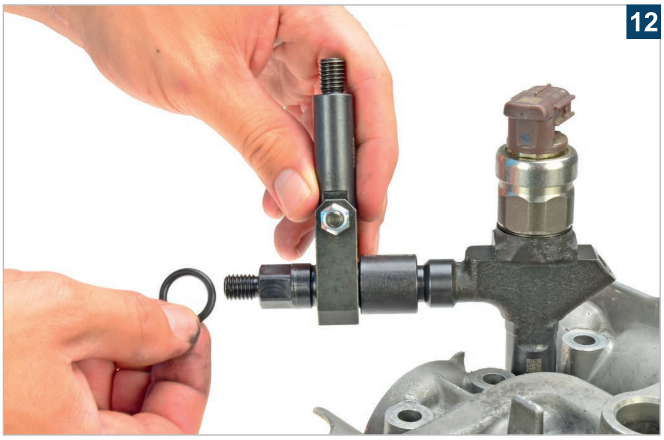
Attention: If the ***adapter 9038432*** ③ is used with the ***Loosening Lever 9038439*** ② and the ***Swivel Joint 9038440*** ⑥ must the O-ring be removed.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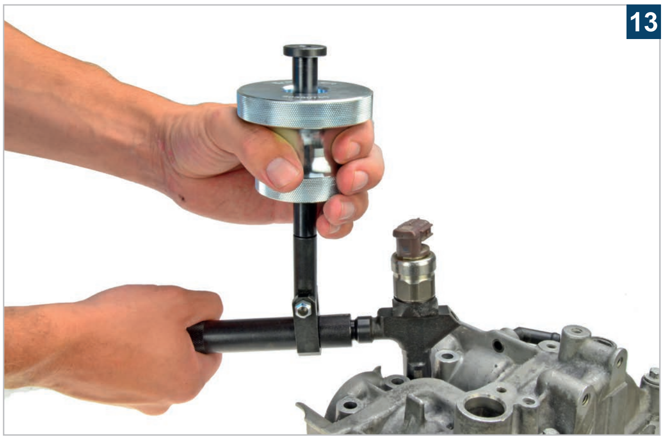
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5. Adapter external thread M10 : internal thread M12

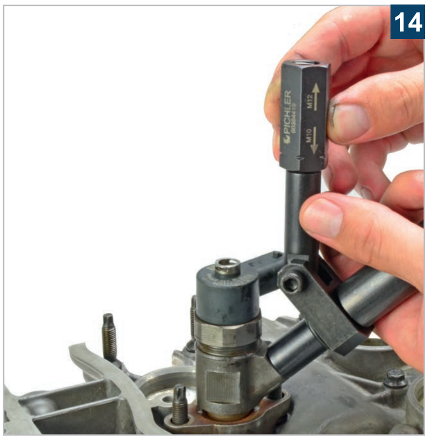
PICHLER
60384419
M10
M12

Adapter 60384419 ⑨

TIP: When there is enough space is it possible to use the ***Slide Bar (205 mm) 60384431*** ⑦ together with adapter ***60384419*** ⑨. Due to the longer slide path of the Slide Hammer a higher impact force is created.

Screw the ***Adapter 60384419*** ⑨ on the ***Swivel Joint 9038440*** ⑥ slide the ***Slide Rod*** (205 mm) ***60384431*** ⑦ through the ***Slide Hammer 60390750*** ⑩ and screw it in the ***Adapter 60384419*** ⑨ and tighten it with a spanner.

Application example using the ***Loosening Lever 9038437*** ① with ***Swivel Joint 9038440*** ⑥: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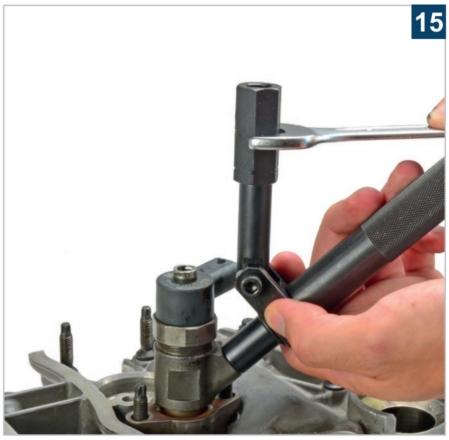
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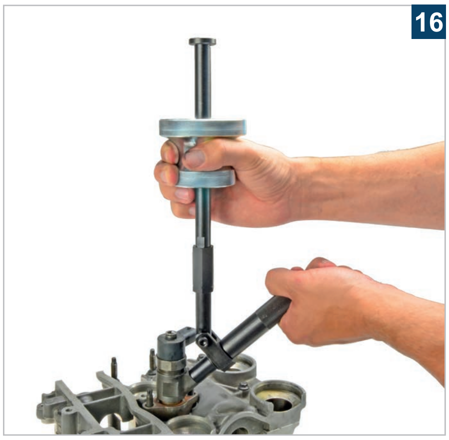
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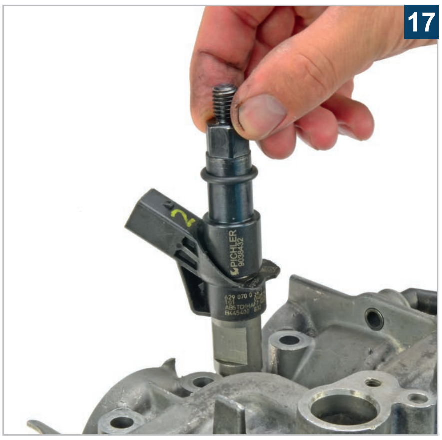
6. Delphi, Bosch & Denso injectors with fixed connecter for the diesel injection line M14x1.5 (piezo controlled)

PICHLER
9038432

Adapter internal thread M14x1.5 : external thread M10 9038432 ③

Screw the ***Adapter 9038432*** ③ on the diesel line connector of the injector and tighten it with a spanner 13.

Screw the ***Slide Hammer 60390750*** ⑩ with Slide Rod (115 mm) or ***Slide Hammer 1030210*** (not included in the kit) on the Swivel Joint. Remove by simultaneously juddering the Loosening Lever and hitting with the Slide Hammer the injector from of the cylinder head.



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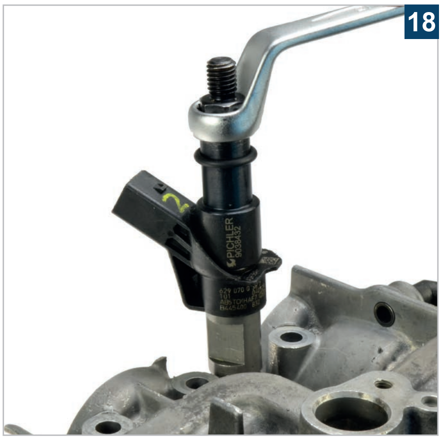

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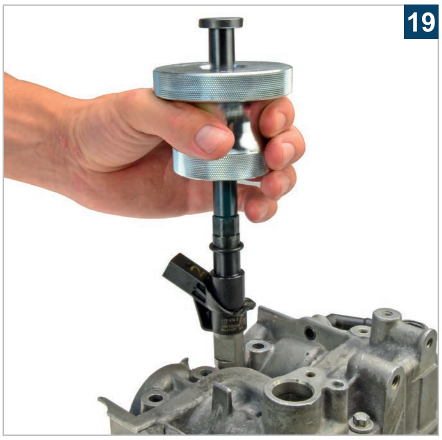

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TIP:

When there is enough space is it possible to use the ***Slide Rod (205 mm) 60384431*** ⑦ ***(see page 7).***

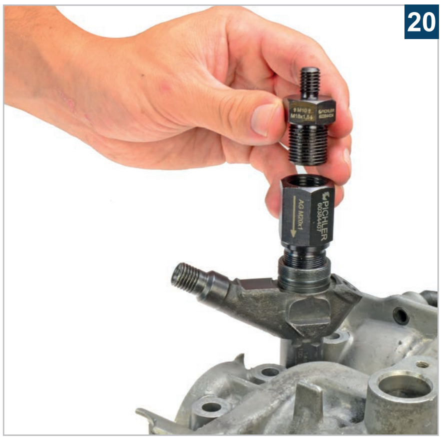
Due to the longer slide path of the Slide Hammer a higher impact force is created.

7. Adapter 60384404 external thread M10 : external thread M18x1.5

Adapter external thread M10: external thread M18x1.5
60384404 ⑧

Adapter which makes it possible to use the adapters, e.g. from the set ***60384660*** with ***Slide Hammer 60390750*** ⑩ or ***Slide Hammer 1030210*** (not included in the kit).

Screw the ***Adapter 60384404*** ⑧ in the appropriate adapter and tighten it with a spanner 17. Screw the Slide Rod (115 mm) of ***Slide Hammer 60390750*** ⑩ on ***Adapter 60384404*** ⑧ and remove by hitting with the Slide Hammer the injector.



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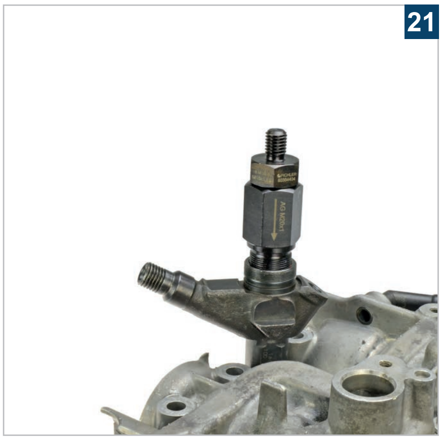

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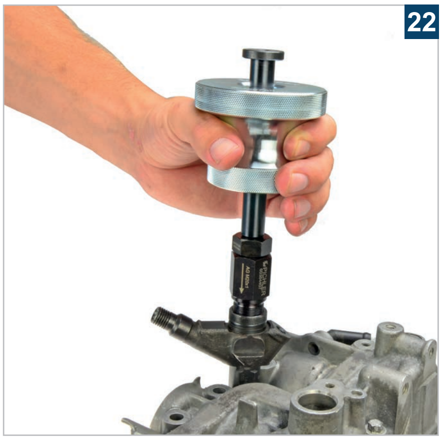

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TIP:

When there is enough space is it possible to use the ***Slide Bar (205 mm) 60384431*** ⑦. ***(see page 7)***

Due to the longer slide path of the Slide Hammer a higher impact force is created.

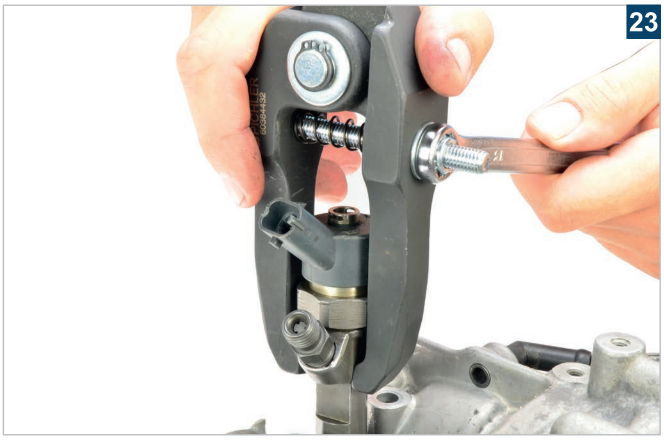
8. Removing the injector with the Adjustable Claw e.g.: Desno, Delphi, etc.

PICHLER
60384432

Adjustable Claw *60384432* ⑤

Open the ***Adjustable Claw 60384432*** ⑤ as far open as possible by unscrewing the cross bolt. Determine the gripping surface on the injector and fix the claw to the injector by tightening the cross bolt (hex 13).

Insert the ***Slide Rod (205 mm) 60384431*** ⑦ in the ***Slide Hammer 60390750*** ⑩ and screw it in the claw and remove by hitting with the Slide Hammer the injector.



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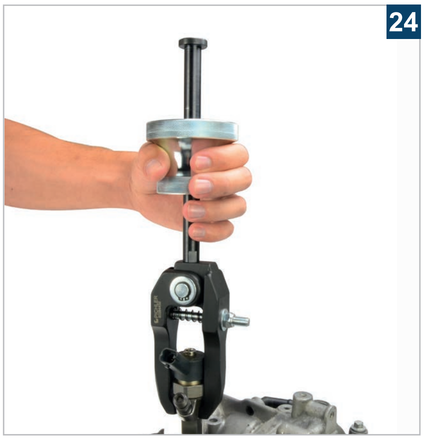

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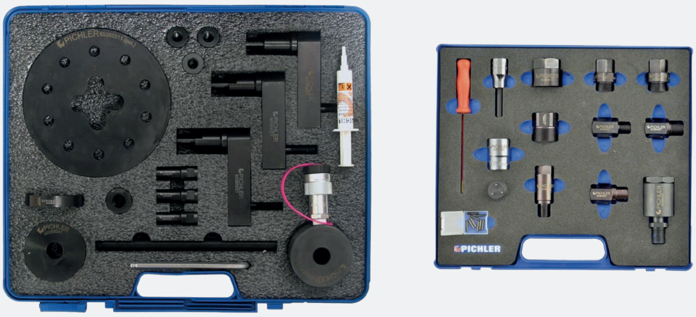
9. Recommended accessories

Universal Injector Removal Kit

with Hydraulic Open Core Cylinder 12t and Adapter Set (Bosch, Denso, Siemens, Delphi)



60385445

Hydraulic Set 3 pc. 700 bar

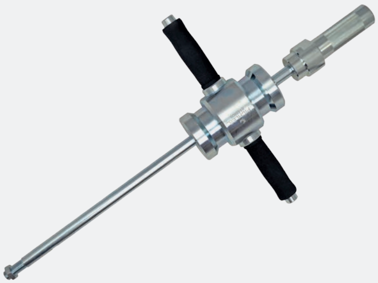
80255500

Injector Removal Adapter Set 15 pc.

60384660

Slide Hammer 8.5 kg

external thread M18x1.5, stroke 400 mm



6148800

Slide Hammer 0.7 kg

internal thread M10, stroke: 140 mm

1030210

Universal Injector Shaft Cleaning Kit complete with 5 modules

9038100

Glowplug Hole Brushes Set

14 pc

90490300

Injector Needle Puller

6038472E

Universal Injector Copper Washer Remover

6039070

Cotton Swabs Set „SWAB-EEZ“

9495291

Air Hydraulic Pump

700 bar with Hydraulic Pressure Gauge, 3 m Hose and Ball Valve

80255575

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